Vol. 1062 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 28, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 28, 1986 Volume 1062 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1062 OG 432
Board of Appeals Decisions Rendered in the Month of Dec. 1985	1062 OG 432
Notice of Maintenance Fees Payable	1062 OG 432
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1062 OG 433
Reissue Applications Filed	1062 OG 433
Requests for Reexaminations Filed	1062 OG 433
Survey of Registered Practitioners in Patent Cases	1062 OG 433
Service by Publication	1062 OG 433
Final Order	1062 OG 433
Variety Naming Requirements for Plant Patent Applications	1062 OG 433
PTO Status	1062 OG 434
Patent Certificates of Correction	1062 OG 436
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1062 OG 437
Condition of Patent Applications	1062 OG 438
Reexaminations	1271
Reissue Patents Granted (32,072)	1273
Plant Patents Granted (5,645)	1275
Patents Granted	
General and Mechanical (4,566,136)	1277
Chemical (4,566,874)	1549
Electrical (4,567,316)	1659
Design Patents Granted (282,308)	1763
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 56
Classification of	
Patents (Including Reissues and Reexaminations)	PI 61
Designs and Plants	PI 64
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 65
Designs and Plants	PI 66
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *PCT Gazette* on Oct. 24, 1985 and in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Feb. 9, 1986	750.00
if paid on or after Feb. 9, 1986	830.00
International fees	
Basic fee (first 30 pages):	
if paid before Jan. 1, 1986	280.00
if paid on or after Jan. 1, 1986	325.00
Basic Supplemental fee (for each page over 30):	
if paid before Jan. 1, 1986	6.00
if paid on or after Jan. 1, 1986	6.00
Designation fee for the first 10 national or regional offices:	
if paid before Jan. 1, 1986	70.00
if paid on or after Jan. 1, 1986	80.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Dec. 17, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Dec. 1985

Affirmed	139
Affirmed in Part	20
Reversed	66
Total	225

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 25, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,369,526 through 4,370,753
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, NO PATENTS EXPIRED ON NOV. 10, 1985, DUE TO FAILURE TO PAY MAINTENANCE FEES.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,512,345, Re. S.N. 802,210, Filed Nov. 25, 1985, Cl. 128/325, SURGICAL CLIP APPLYING APPARATUS AND CLIPS AND CLIP TRAIN FOR USE THEREIN, David T. Green, Owner of Record: *United States Surgical Corp., Norwalk, Conn.,* Attorney or Agent: Charles B. Smith, et al., Ex. Gp.: 333

4,513,578, Re. S.N. 802,351, Filed Nov. 26, 1985, Cl. 62/149, WEIGHT-MONITORED AIR-CONDITIONER CHARGING STATION, Robert H. Proctor, et al., Owner of Record: *Murray Corp., Cockeysville, Md.,* Attorney or Agent: Irvin A. Lavine, et al., Ex. Gp.: 344

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1985 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with T through Z. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with T through Z and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557-1728.

CAMERON WEIFFENBACH,
Nov. 20, 1985. *Director, Office of Enrollment & Discipline.*

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Michael Moss, dba Nu-Vue Hosiery Co., Chicago, Ill., Reg. No. 533,352, for the mark "NU-VUE", Canc. No. 15,077.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

JOSEPH F. NAKAMURA,
Solicitor
U.S. Patent and
Trademark Office

v. Proceeding No. 84-2

HORACE S. HARPER, JR.
Respondent

FINAL ORDER

Upon consideration of the NOTICE OF PROCEEDING UNDER 35 U.S.C. §32 and the Solicitor's MOTION FOR ENTRY OF FINAL ORDER, it is ordered that said motion be and the same is hereby granted. It is further ordered that HORACE S. HARPER (Registration No. 28305) is hereby excluded from further practice before the U.S. Patent and Trademark Office. This FINAL ORDER is being entered pursuant to 35 U.S.C. §32.

DONALD J. QUIGG,
Dec. 5, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Department of Commerce Patent and Trademark Office 37 CFR Part 1 [Docket No. 50716-5116]

Variety Naming Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Revision of proposed rules of practice; Public hearing.
Summary: Extensive comments have been received by the Patent and Trademark Office in response to proposed rules of practice for naming and registering the names of new plant varieties, published in the Federal Register, Vol. 50, page 33062 on Aug. 16, 1985. The proposed rules of practice will be revised in light of these comments. The revised rules will be published for comments and a public hearing will be announced.
For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

DONALD J. QUIGG,
Dec. 11, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Status of PTO Services

The following is an update of the status of PTO services for December 1985:

Service Item	FY 1985 Goal (Calendar Days)	FY 1986 Goal (Calendar Days)	Monthly Average (Calendar Days)
Filing Receipts:			
Patents	22	22	27
Trademarks	30	30	33
Patent/Trademark Copies:			
Special Window Coupons	1	1	99% within 1 day
Window Coupons	5	5	94% within 5 days
Mail Coupons	29	26	99% within 26 days*
Letter Orders	34	26	99% within 26 days*
Date of oldest unfilled order			Dec. 24, 1985
Current Mail Date being processed			Dec. 27, 1985
Certified Copies:			
Trademark Registrations	30	30	20
Applications-As-Filed	20	10	99% within 7 days
File-Wrapper/Contents	N/A	N/A	85% within 7 days
Walk-up Certification	1	1	70% within 24 hours
Trademark Search Library:			
Filing Pending Marks	21	21	26
Filing Reg. Certificates	3	Issue Date	On schedule
Assignments:			
Patents	25	20	19
Trademarks	25	20	20
Avg. Days from Issue Fee Payment to Issue Date	90–100	90–100	93
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	Issue Date	99% on Issue Date

*Figures include postal processing and delivery time.

IMPROVEMENTS IN SERVICES

- *Patent File Access* — In an effort to improve the integrity of the abandoned patent applications stored at the Federal Records Center, all remaining 1960 series files were retrieved, merged into one continuous numerical sequence and returned to the Center. Prior to this effort, the files were in numerous individual sequences as a result of having been forced into retiring files in small quantities. As such, Record Center employees retrieving files sometimes had to check multiple locations. The consolidation will allow Federal Record Center personnel to respond to 1960 series files requests in a more efficient manner.

- *Submission of Drawings* — As further clarification of the Official Gazette Notice of Oct. 29, 1985, drawings for patent applications do *not* need to be submitted on bristol board.

  Since corrections are now the responsibility of applicants, it is more convenient for the original drawings to be kept in their possession. Only copies need to be supplied to the Patent and Trademark Office. Whether or not bristol board is used for the copies is the applicant's choice. However, the copies that are submitted to the Office must be on strong, white, smooth, and non-shiny paper. High-quality copies are necessary not only for the patent examination process, but for printing purposes.

  If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings of the corrected original can then be submitted after the Notice of Allowability is mailed.

  We will be revising 37 CFR to clarify the requirements for drawing submissions.

  In addition, we are planning to change 37 CFR 1.84 to allow submission of drawings in a third size, namely 8½ by 13 inches with a one inch (2.5 cm.) top margin and bottom and side margins of ¼ inch (6.4 mm.) from the edges. Pending the rule change, we will accept drawings in this size.

  This change is being made for the convenience of applicants and attorneys.

HELPFUL HINTS FROM THE PTO

- *Response to Final Rejection — Avoiding Extension Fees* — In regular applications wherein a three (3) month Shortened Statutory Period (SSP) is set for response to a Final Rejection, the response would best be filed within two (2) months of the date of the Office Action. If filed within two (2) months, any Advisory Action mailed after the SSP expires will reset the SSP to expire on the date of the Advisory Action for extension fee purposes, but never more than six (6) months from the date of the Final Rejection.

- *Response to Final Rejection — Expediting Processing and Reply by PTO* — In order to ensure the quickest reply to an amendment or response after Final Rejection the paper should be marked in the upper right portion:

"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)";

and the envelope should be marked in the lower left corner:

"BOX AF".

The marking on the paper preferably should be written in, highlighted by, or encircled with, a bright color felt-point marker.

If the paper is being hand-carried to the Examining Group (instead of mailing to Box AF), the envelope also should be marked:

"RESPONSE UND ER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)"

Any questions should be directed to Al Lawrence Smith, Director, Group 350, on (703) 557–3414.

Jan. 7, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 28, 1986

3,522,110	4,517,589	4,537,905	4,547,528
4,260,556	4,517,606	4,538,178	4,547,701
4,307,447	4,518,026	4,538,265	4,547,764
4,348,553	4,518,605	4,538,616	4,547,877
4,373,949	4,519,751	4,538,711	4,548,311
4,407,673	4,522,702	4,539,127	4,548,362
4,412,001	4,527,558	4,539,827	4,548,548
4,435,403	4,527,797	4,539,849	4,548,807
4,446,279	4,530,161	4,540,037	4,549,415
4,448,085	4,530,162	4,541,569	4,549,605
4,452,171	4,530,894	4,541,655	4,549,618
4,460,150	4,531,018	4,542,102	4,549,866
4,460,151	4,531,079	4,542,130	4,550,031
4,463,951	4,531,243	4,542,711	4,550,103
4,475,010	4,531,449	4,542,812	4,550,280
4,478,068	4,531,558	4,543,406	4,550,426
4,479,949	4,532,105	4,543,414	4,550,508
4,483,287	4,533,494	4,543,693	4,551,224
4,486,096	4,534,657	4,543,733	4,551,523
4,486,566	4,534,827	4,544,209	4,551,574
4,489,714	4,535,124	4,544,496	4,551,822
4,495,067	4,535,519	4,544,687	4,552,187
4,500,461	4,535,767	4,544,737	4,552,237
4,500,536	4,535,892	4,544,758	4,552,517
4,501,234	4,535,967	4,545,114	4,552,759
4,504,373	4,536,309	4,546,187	4,552,811
4,507,187	4,536,398	4,546,772	4,553,912
4,512,498	4,536,573	4,547,119	4,554,463
4,514,346	4,536,806	4,547,508	4,556,622
4,515,924	4,537,603	4,547,515	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 7, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-11-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during December 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,413,656 to 3,419,906, inclusive

Plant Patents ..... Numbers 2,847 to 2,855 inclusive

REEXAMINATIONS

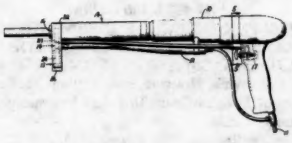
JANUARY 28, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,750,257 (447th)
SYSTEMATIZED APPARATUS FOR DRIVING FASTENERS

Imre Berecz, Yorba Linda, Calif., assignor to Kaynar Mfg. Co., Inc., Fullerton, Calif.

Reexamination Request No. 90/000,438, Aug. 29, 1983.
Reexamination Certificate for Patent No. 3,750,257, issued Aug. 7, 1973, Ser. No. 214,262, Dec. 30, 1971.
Int. Cl.[4] B23Q *7/10*; B23P *19/04*
U.S. Cl. 29—813



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

Claims **13** and **14** are cancelled.

New claims **15** and **16** are added and determined to be patentable.

1. A portable powered tool for individually delivering and drivably rotating threaded female fasteners, each fastener having an externally presented wrenching surface of non-circular configuration in cross-section, the tool comprising:

a. a supporting frame;

b. means connecting the tool to a source of power;

c. a tool socket having an internal wrenching surface of non-circular configuration in cross-section complementary to said external wrenching surface and being mounted in the frame for rotation about an axis;

d. supply means for said female fasteners carried by the frame and adapted to hold a plurality of said fasteners and to deliver same in a selected position of orientation at a discharge station;

e. powered transfer means carried by the frame and adapted to receive an individual fastener at said discharge station and to transport said fastener to a driving station;

f. drive motor means for drivably rotating said tool socket and any individual fastener held therein;

g. first power circuit means selectively actuable to establish communication with said source of power and for powering said transfer motor means to move said transfer means between said discharge and said driving station; and

i. second power circuit means operable responsively to movement of said transfer means for powering said drive motor means.

15. For use in a systematized nut driving apparatus comprising an elongate magazine defining an internal right circular cylindrical chamber having a first diameter, said magazine having a loading end provided with a magazine sealing surface extending radially outwardly from the chamber at a right angle to the central axis of said chamber to a second diameter greater than said first diameter, said magazine including a delivery station at an end opposite the loading end thereof, said magazine also including an air inlet communicating with the chamber thereof adjacent the loading end thereof for the introduction of pressurized air to effect delivery of nuts to the delivery station, a support bracket for said magazine having a loading gate therein aligned with but spaced from the sealing surface on said magazine, and a plurality of internally threaded nuts each comprising a body having a radially extending bearing surface and a circular radially outer periphery extending to a third diameter slightly smaller than said first diameter so as to be slidably accepted in the chamber of said magazine and propellable therethrough by pressurized air introduced into the chamber through the air inlet in said magazine, the body of each of said nuts having external wrenching surfaces axially spaced from the bearing surface thereof extending to a fourth maximum transverse dimension smaller than said third diameter, the body of each of said nuts having an internally threaded bore open at each end and having a fifth minimum internal diameter smaller than said fourth transverse dimension,

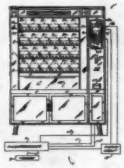
a multipurpose shipping, loading, delivery, and magazine sealing but carrier comprising an elongate shaft having a sixth transverse dimension smaller than said fifth minimum internal diameter and acceptable axially through the bore of each of said nuts for the slidable support thereof, said carrier having a rigid enlarged head longitudinally fixed to the shaft at one end thereof to limit axial movement of said nuts along the shaft toward the one end thereof, the head having a carrier sealing surface lying in a plane extending generally parallel to the sealing surface on said magazine and extending radially outwardly to a diameter greater than said first diameter and facing the end of the shaft opposite said one end so as to be engageable in pneumatic sealing relationship with the magazine sealing surface on the loading end of said magazine, the head on said carrier having a substantial longitudinal dimension and a radially extending end surface so as to be tightly accepted between the sealing surface on said magazine and the loading gate on said support bracket to preclude movement of said carrier out of said magazine, whereby an air pressure differential is created across said nuts upon the introduction of pressurized air through the magazine air inlet into the chamber thereof effective to urge said nuts toward the delivery station of said magazine, and

an entry tip secured to the shaft at the end opposite the head thereon to limit axial movement of said nuts toward said opposite end.

B1 4,231,105 (448th)
VENDOR CONTROL CIRCUIT

James T. Schuller, St. Louis County; Paul N. Albrecht, Ballwin, and Hugo M. Canizares, Bridgeton, all of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Reexamination Request No. 90/000,754, Apr. 11, 1985.
Reexamination Certificate for Patent No. 4,231,105, issued Oct. 28, 1980, Ser. No. 921,960, Jul. 5, 1978.
Int. Cl.[4] G07F *11/62*; G06F *15/21*
U.S. Cl. 364—900



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–38** is confirmed.

1. Apparatus for controlling the functioning of a vendor for vending a plurality of items, each item having at least one parameter associated therewith, comprising:

a memory having a plurality of addresses for storing values of at least some of the parameters in predetermined memory addresses, the parameter values stored in the predetermined memory addresses being electrically alterable;

processing means responsive to a plurality of vendor status inputs, a plurality of inputs from the memory, and a plurality of control inputs, for performing arithmetic and logic operations with those inputs and with the values of the parameters associated with the items in a sequence controlled by a preselected set of instructions which constitute a program and for supplying output signals based upon results obtained from said operations to control functioning of the vendor, the predetermined memory addresses being accessible by the processing means and the parameter values stored therein being alterable by said processing means;

interrogation means operable by authorized personnel for retrieving from memory the values of at least some of the parameters stored therein; and

display means for visually displaying a parameter value retrieved from memory by the interrogation means independently of any other input of said processing means being equal in value to the value of the parameter retrieved from the memory, whereby authorized personnel may utilize the interrogation means to retrieve the value of a desired parameter from the memory.

B1 4,251,648 (449th)

PEROXIDE CURED EPIHALOHYDRIN POLYMERS

John T. Oetzel, Elyria, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Reexamination Request No. 90/000,634, Sep. 21, 1984.
Reexamination Certificate for Patent No. 4,251,648, issued Feb. 17, 1981, Ser. No. 810,654, Jun. 27, 1977.
Int. Cl.[4] C08G *65/32*
U.S. Cl. 525—187

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

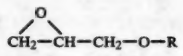
Claims **6, 7, 11–13, 16** and **23** are cancelled.

Claims **1, 3–5, 8, 9, 14** and **17** are determined to be patentable as amended.

Claims **2, 10, 15** and **18–22**, dependent on an amended claim, are determined to be patentable.

New claims **24–30** are added and determined to be patentable.

1. A composition comprising a polymer of an epihalohydrin and an unsaturated ether of the general formula



wherein R is an ethylenically unsaturated radical[,] an acid acceptor *selected from the group consisting of Group IA, IIA, IVA compounds, and mixtures thereof, but excluding lead oxides*[,]; an unsaturated polyfunctional methacrylate; and a curing agent consisting an organic peroxide.

B1 4,270,606 (450th)

APPARATUS FOR SELECTIVE DISENGAGEMENT OF A FLUID TRANSMISSION CONDUIT AND FOR CONTROL OF FLUID TRANSMISSION FROM A WELL ZONE

David M. McStravick, Houston, and William M. Roberts, Deer Park, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Reexamination Request Nos. 90/000,593, Jul. 12, 1984 and 90/000,692, Dec. 18, 1984.
Reexamination Certificate for Patent No. 4,270,606, issued Jun. 2, 1981, Ser. No. 20,306, Mar. 14, 1979.
Int. Cl.[4] E21B *33/129, 34/12*
U.S. Cl. 166—181

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **14, 15, 25–39, 41** and **42** are cancelled.

Claims **1, 3, 13, 16, 24, 40, 43** and **50** are determined to be patentable as amended.

Claims **2, 4–12, 17–23** and **44–49**, dependent on an amended claim, are determined to be patentable.

New claims **51–61** are added and determined to be patentable.

REISSUES

JANUARY 28, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,072

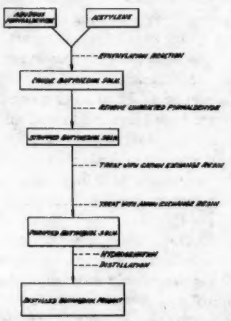
PROCESS OF PRODUCING A DISTILLED BUTANEDIOL PRODUCT OF HIGH QUALITY IN HIGH YIELD

Max E. Chiddix, League City, Tex., assignor to GAF Corporation, Wayne, N.J.

Original No. 4,371,723, dated Feb. 1, 1983, Ser. No. 290,548, Aug. 6, 1981. Continuation of Ser. No. 140,926, Apr. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 812,615, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 675,686, Apr. 9, 1976, abandoned. Application for reissue Mar. 2, 1983, Ser. No. 471,320

Int. Cl.[4] C07C *31/20*

U.S. Cl. 568—861 **15 Claims**



1. In the process of producing distilled butanediol product from an aqueous butynediol solution which contains metallic and formate ions, which process comprises hydrogenating said butynediol to butanediol and distilling said butanediol, the improvement which is characterized by:

treating said butynediol solution prior to said hydrogenation treatment with a cationic exchange resin to remove said metallic ion, and an anionic resin to remove formate ion, then hydrogenating and distilling the butanediol at [about 160°–200° C.] *a pot temperature of 110°–200° C. at a subatmospheric pressure of 40 mm Hg or less* to obtain a distilled butanediol product [having a purity of at least 99.7%,] in a yield of at least 93%, and a residue which is fluid and pumpable at the distillation temperature for recycling or disposal thereof.

Re. 32,073

DENTAL FILLING COMPOSITION UTILIZING ZINC-CONTAINING INORGANIC FILLER

Ronald M. Randklev, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 4,358,549, dated Nov. 9, 1982, Ser. No. 288,289, Jul. 30, 1981. Continuation-in-part of Ser. No. 184,916, Sep. 8, 1980, abandoned. Application for reissue Sep. 24, 1984, Ser. No. 654,190

Int. Cl.[4] A61K *5/01, 5/06, 6/08;* C08K *3/40*

U.S. Cl. 523—117 **20 Claims**

***9.** A dental filling composition comprising a polymerizable resin binder and a finely divided inorganic glass filler which is X-ray opaque and single phase, wherein said X-ray opaque inorganic glass filler consists essentially of, in percent by weight:*

Zinc oxide	*20 to 35%*

-continued

Silica	*45 to 65%*
Boric oxide	*3 to 15%*
Aluminum oxide	} *combined weight of*
Aluminum fluoride	} *at least about 10%*
Alkali metal oxide or alkaline earth metal oxide	*0 to 5%*

wherein the weight of aluminum floride is sufficient to contribute to the melt fluidity of the glass and enable it to be poured in the form of thin filaments for rapid cooling thereof, and wherein said glass exhibits an X-ray absorption characteristic of at least 1/16 inch.

Re. 32,074

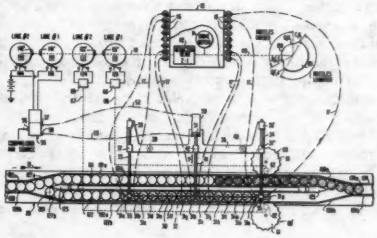
HIGH-SPEED FILLING MACHINE

Richard N. Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Original No. 4,073,322, dated Feb. 14, 1978, Ser. No. 735,034, Oct. 22, 1976. Application for reissue May 7, 1979, Ser. No. 36,745

Int. Cl.[4] B65B *43/54*

U.S. Cl. 141—169 **42 Claims**



23. A filling machine with a filling station for filling containers with a fluid product by the use of several filling nozzles, which comprises two substantially parallel channel means within the area of the filling station, which are defined at least in part by a *conveyor belt* continuously running [,] in operation, [conveyor belt,] a number of filling units operatively connected with a corresponding number of filling nozzles, nozzle support means supporting thereon the filling nozzles in proper position, means for lowering and raising the nozzle support means and therewith the filling nozzles into and out of containers held under the filling nozzles, indexing means for said channel means for holding containers stationary in their filling positions during the filling operation on the conveyor belt and control means for the filling machine to control its operation including means for correlating the operation of the indexing means and the lowering and raising of the nozzle support means with the operation of the filling units, characterized in that reciprocating means which are operatively connected with the control means are provided for the nozzle support means to alternately place the filling nozzles over the containers to be filled in one channel means and after completion of the filling operation thereof, to move the nozzle support means transversely to the direction of movement of the conveyor belt over the other of the two channel means to fill the containers which have been brought into filling position in the meantime in said other channel *means* and which are held

stationary thereat during the filling operation by the respective indexing means.

Re. 32,075

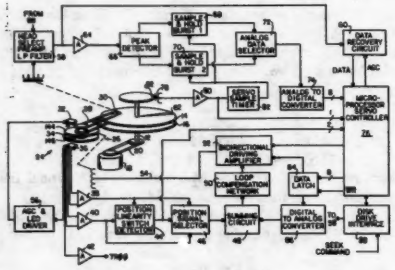
DATA TRANSDUCER POSITION CONTROL SYSTEM FOR ROTATING DISK DATA STORAGE EQUIPMENT

Joel N. Harrison, Campbell; Donald V. Daniels, Santa Cruz, and David A. Brown, Saratoga, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Original No. 4,396,959, dated Aug. 2, 1983, Ser. No. 190,198, Sep. 24, 1980. Application for reissue Apr. 3, 1984, Ser. No. 596,438

Int. Cl.[4] G11B *21/10, 21/08;* H02K *37/00*

U.S. Cl. 360—77 32 Claims



1. In a data storage device including a frame, a data storage disk journalled to the frame and rotatingly driven by motor means at a constant velocity and characterized by a multiplicity of concentric data tracks on a major surface thereof, at least one data transducer head structure in close proximity to said disk surface, the improvement comprising:

a bidirectionally rotatable electromechanical rotor journalled to said frame adjacent to said disk,

a head mounting structure securing said head at one end thereof and secured to said rotor at the other end thereof for moving said head across said multiplicity of concentric data tracks,

*bi*directional rotor driver means connected to said rotor for rotating said structure to maintain it within a selected data track during read and/or write operations and to move said structure from a departure track to a destination track during track seeking operations.

a head position transducer providing a polyphase position signal in response to sensed actual position of said head structure relative to said frame,

head controller means connected to said head position transducer, said rotor driver and to an external source of track selection information, for recording the present track position of said head structure, for calculating a track seeking command in response to known head position and said track selection information, and for commanding said head to move from a known depature track to a requested destination track during a track seeking operation [by commanding at said rotor a first head position spatial increment of maximum forward direction acceleration followed by a similar head position spatial increment of maximum reverse direction acceleration and then by commanding adaptively a slewing rate] dependent upon said polyphase incremental head structure position information from said head position transducer until said destination track is reached,

a position dependent closed loop servo connected to said head position transducer and to said rotor driver for operatively controlling said driver to keep said head positioned within a selected one of said data tracks during read and/or write operations, said loop being open during track seeking operations until occurrence of adaptively commanded slewing,

a fine position closed loop servo connected to said driver and further including a single, data masked servo sector on a data surface of said disk containing track centerline servo control data therein readible by a head of said structure adjacent to said surface, a sample and hold circuit connected to said head during passes over said sector for holding control data read therefrom, and correction signal generator means for generating an offset signal for application to said driver to promote and maintain track centerline alignment of said head during read and write operations, said fine position loop being opened during track seeking operation.

PLANT PATENTS

GRANTED JANUARY 28, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,645

ROSE PLANT JACPO

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jul. 16, 1984, Ser. No. 631,564
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its high production of light yellow buds on 12" to 14" stems, many of which are borne in clusters; its resistance to rose powdery mildew; its lack of fragrance.

5,646

ROSE PLANT

Pernille Olesen, and Mogens Olesen, both of 58 Kellerlisvej, DK 3490 Kvistgaard, Denmark

Filed Mar. 30, 1984, Ser. No. 595,416
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the grandiflora rose class, substantially as shown and described, characterized particularly by unique bright red and silver bicolor flowers with yellow lower petal segments producing an overall bright orange-red and silver bicolor effect.

5,647

ROSE PLANT JACFAR

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jul. 16, 1984, Ser. No. 631,452
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of large plant producing long-stemmed blooms of a light yellow with no fragrance, approximately 27 petals, with numerous hooked prickles and numerous small prickles.

5,648

ROSE PLANT INTERVAL

G. Peter Ilsink, Leersum, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jun. 29, 1984, Ser. No. 626,160
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—23 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous plant, producing long stems bearing stiff petaled, near white buds, opening to near white fragrant blooms; its mildew resistance.

5,649

OLEA EUROPAEA CV. MONHER

Julian Herman, Irvine, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jul. 23, 1984, Ser. No. 633,359
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—33 1 Claim

1. A new and distinct selection of *Olea europaea* as substantially shown and described herein, characterized particularly as to novelty by the unique combination of more corolla lobes per flower, a lighter green color of foliage, foliage which is longer, more narrow and thinner in texture and a finer and more open appearance to the overall habit of the tree and lack of fruit.

5,650

PLUM TREE "RAY'S HOPE"

Casselman, deceased, Arthur R., late of Exeter, Calif., and Jessie M. Casselman, legal representative, 257 S. Quince, Exeter, Calif. 93221

Filed Feb. 2, 1984, Ser. No. 576,487
Int. Cl.[4] A01H 5/03
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree substantially as illustrated and described, broadly characterized by its general similarity to the unpatented Casselman Plum Tree, which it most nearly resembles and of which it is believed to be a sport but from which it is distinguished as to novelty by its fruit ripening four to five weeks later than that of the Casselman Plum Tree.

5,651

APRICOT TREE—HOMEDALE CULTIVAR

Garfield Shults, Homedale, Id., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed Apr. 23, 1984, Ser. No. 602,673
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—39 1 Claim

1. A new and distinct variety of apricot tree, substantially as illustrated and described, characterized by (a) a medium-small spreading growth habit, (b) an extended bloom period, (c) enhanced spring frost tolerance, (d) abundantly forms deliciously flavored medium-sized fruit which is meaty textured and juicy and bears an attractive orange skin color having a bright red blush, and (e) forms a sweet edible almond-type kernel.

5,652

DISCOVERED AND ASEXUALLY REPRODUCED A CERTAIN NEW AND DISTINCT VARIETY OF ASPARAGUS PLANT

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Oct. 21, 1983, Ser. No. 544,649
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of Asparagus Plant as herein shown and described, distinguished particularly as to novelty by its unique combination as a female plant which transmits high yield, resistance to rust (*Puccinia asparagi*) good field tolerance to root and crown rot (*Fusarium oxysporum*) and (*F. moniliforme*) provides a vigorous plant having an average of 24 stalks of mean diameter (three largest stalks) of 29.8 mm, and a stalk vigor index (Number$\times$(Mean diameter)^2) of 21,313.

PATENTS

GRANTED JAN. 28, 1986

ERRATA

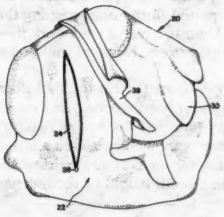
For CLASS	See PATENT NO.
036–011	4,566,197
244–012	4,566,699
180–008	4,566,707
426–326	4,567,030
132–070	4,567,039
264–243	4,567,301
346–058	4,567,459

PATENTS

GRANTED JANUARY 28, 1986

GENERAL AND MECHANICAL

4,566,136
NURSING BLOUSE WITH HIDDEN OPENING
Sylvia S. Echols, 4414 Cannon Rd., Loganville, Ga. 30249
Filed Aug. 12, 1983, Ser. No. 522,321
Int. Cl.[4] A41D *1/20*
U.S. Cl. 2—104 **2 Claims**



1. A fabric nursing blouse for nursing mothers providing concealment for the breast in the nursing of an infant, said blouse having a front side with a breast panel having an elongated opening for exposing a breast for the nursing of the infant, a concealment flap connected to the front side of the blouse extending alongside of the opening and overlying the opening a sufficient extent to cover the breast while the infant is nursing through said opening and a zipper connected to an underside of said panel along said opening for opening and closing thereof, said breast panel opening in the closed position having opposite panel portions butted together to overlie and obsure said zipper, said opposite panel portions being each folded over at the blouse opening to provide an underlying fold strip and butted together at the aforementioned fold in the blouse opening closed position and the zipper being comprised of a pair of zipper strips adapted to be locked and unlocked together, said zipper strips being connected to said underlying fold strips, said zipper strips being provided with interlocking teeth on opposite sides of the zipper strips adapted to be locked together and unlocked and said teeth underlying and being connected to the folded edges of said panels and fold strips.

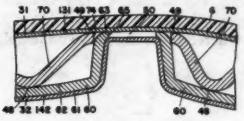
4,566,137
INFLATABLE BAFFLED LINER FOR PROTECTIVE HEADGEAR AND OTHER PROTECTIVE EQUIPMENT
Elwyn R. Gooding, 2989 W. North Territorial Rd., Ann Arbor, Mich. 48105
Filed Jan. 20, 1984, Ser. No. 572,529
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—413 **25 Claims**

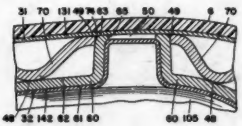
1. A liner for use in a protective helmet and other protective equipment, comprising:

(a) a first flexible plastic sheet;

(b) a second flexible plastic sheet fixedly attached to the first plastic sheet, the first and second attached sheets forming at least two spaced apart pre-formed air compartments with an integral pre-formed intercommunicating air channel therebetween;

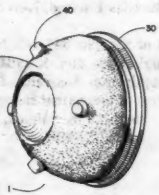
(c) at least one resilient bafflement positioned within the air compartments and in contact with at least one of the plastic sheets, the bafflement having formed thereon sidewall edges with protrusions sized to engage open ends of the corresponding intercommunicating air channel; the two air compartments and the resilient bafflement continually co-acting to control a variable rate of flow between the compartments in direct response to varying forces of impact to the air compartment, the variable rate of flow being regulated by the movement of the resilient bafflement against the open ends of the intercommunicating air channel responsive to the impact forces; and





(d) means, for inflating the two air compartments to a similar desired pressure, through the intercommunicating channel associated with one of the flexible sheets.

4,566,138
PROSTHETIC DEVICE WITH SPACERS
Edward L. Lewis, South Bend; Jack E. Parr, North Webster; Mark A. Fox, Leesburg, and Robert L. Fuson, Warsaw, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Continuation of Ser. No. 473,500, Mar. 8, 1983, abandoned. This application Apr. 24, 1985, Ser. No. 725,504
Int. Cl.[4] A61F *1/04*
U.S. Cl. 623—22 **9 Claims**

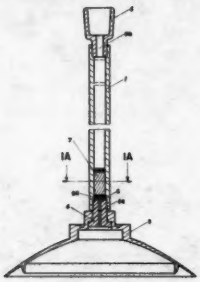


1. An acetabular cup to be secured to a supporting bone member by a thickness of acrylic bone cement applied therebetween comprising an inner ultra high molecular weight polyethylene member having a metal outer shell wherein said shell further includes a porous outer surface over at least a portion thereof and said porous surface having a plurality of spacers adhered thereto and projecting a predetermined distance therefrom, said spacers being composed at least in part of acrylic material.

4,566,139
PISTON PLUNGER
Chi-Cheng Jeng, No. 32 Chien Kuang Rd., Kaohsiung, Taiwan
Filed Dec. 6, 1983, Ser. No. 558,472
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—255 **1 Claim**

1. A piston plunger comprising a suction cup, a connector at the base of the cup, a cylindrical tube extending from the connector, a handle on the end of the tube, and a piston inside

of the cylindrical tube, the connector having an air hole for connecting the interior of the cylindrical tube with the interior of the suction cup, the handle including an air vent communicating with the interior of the cylindrical tube, a pair of symmetrical piston-guiding rails on the internal wall of the cylindrical tube, a pair of guiding flutes on the piston interfitting with the guiding rails to enable the piston to move up and down in the cylindrical tube, each end of the piston having a rubber gasket, whereby pressing down on the plunger with the



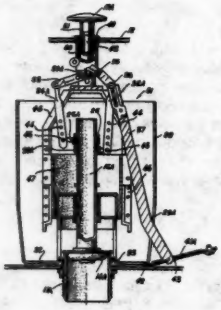
suction cup engaging over the opening of a clogged pipe or the like causes air in the suction cup to be forced through said air hole in the connector and into the cylindrical tube pushing the piston up the tube until the suction cup is suctioned against the opening, whereupon air in the tube can pass between the piston-guiding rail and the guiding flutes so that the piston may drop gravitationally down onto the connector and whereby repeating the action of pressing the plunger down against the opening is effective for unclogging the pipe or the like.

4,566,140

SELECTIVE FLUSH CISTERN

Neil R. Musgrove, New South Wales, Australia, assignor to James Hardie Industries Limited, New South Wales, Australia

Continuation-in-part of Ser. No. 547,745, Nov. 1, 1983, Pat. No. 4,527,296. This application Jun. 1, 1984, Ser. No. 616,313
Claims priority, application Australia, Jun. 8, 1983, PF9747
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.⁴ E03D 1/14
U.S. Cl. 4—324 **4 Claims**



1. A selective-flush operating mechanism for use with apparatus comprising:

a cistern body having a bottom discharge drain aperture and a lid having a hole in it,

a closure valve normally seated on said drain,

a single press-button extending through said hole, valve lifting means which upon said press-button being depressed causes said closure valve to be lifted from said drain,

a float whereby said closure valve is held elevated once lifted and allowed to re-seat on said drain upon conclusion of a flush, and

float-controlled means for water-replenishment of said body; said selective-flush operating mechanism comprising:

an open-top partial-flush pot included within said cistern body, said partial-flush pot containing the aperture of said drain, said closure valve and said float, and having a doorway open to the inside of said body adjacent its bottom;

a normally open door for closing said doorway; and

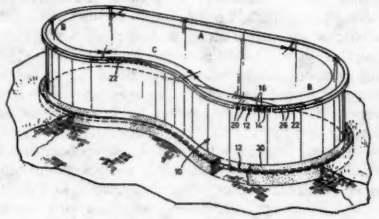
a linkage operatively connecting said press-button with said closure valve and said door, such that on lifting said press-button said closure valve is lifted and said door is closed, wherein said linkage is length adjustable to permit adjustment of the overall height of the mechanism.

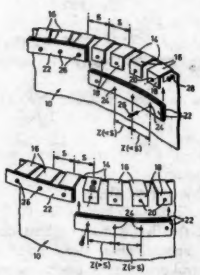
4,566,141

SWIMMING POOL WALL CONSTRUCTION IN POOLS OF THE TYPE USING A METAL SIDE WALL

Morgan D. Mahoney, P.O. Box 69, Hastings, Ontario, Canada (K0L 1Y0)

Filed Jun. 6, 1983, Ser. No. 501,613
Int. Cl.⁴ E04H 3/18
U.S. Cl. 4—506 **8 Claims**





1. Swimming pool wall construction, comprising:

a metal wall for vertical disposition and designed to extend longitudinally in a horizontal direction and to define an inside and an outside relative to the pool to be enclosed by said wall,

a plurality of metal members attached to said wall adjacent the upper edge thereof to extend outwardly therefrom,

said members being spaced from each other in such longitudinal direction,

an extent on the end of each member remote from said wall, which is substantially parallel to said wall,

an aperture in each vertical extent,

a metal strip, designed to extend longitudinally along said wall for attachment to said parallel extents having a plurality of spaced apertures for respective location in respective registration with said vertical extent apertures,

shank members designed to pass through registering pairs of parallel extent apertures and strip apertures and to couple said extent and strip,

wherein over at least a part of said wall the longitudinal spacing of said extent apertures differs from that of said strip apertures whereby the wall at such part curves in plan view,

wherein said metal strip is a channel, hairpin shaped in section viewed perpendicular to said longitudinal direction, defining a pair of opposed webs,

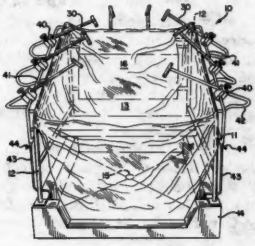
said channel being designed so that said vertical extent is received between said webs and an aperture in each of said webs is designed to register with an aperture in said parallel extent and whereby each said shank member passes through aligned apertures of one web, the vertical extent, and the other web.

4,566,142

SEAT SHOWER

Timothy J. Roberts; Thomas J. Roberts, Jr.; Thomas J. Roberts, Sr., all of Wood Dale, and Robert P. Marinier, Jr., Glendale Heights, all of Ill., assignors to Hospital Therapy Products, Inc., Wood Dale, Ill.

Filed Jun. 6, 1983, Ser. No. 501,131
Int. Cl.⁴ A47K *3/22*
U.S. Cl. 4—604 **8 Claims**



1. A shower bath for use in the treatment of patients highly susceptible to infection causing bacteria comprising, in combination,

a base adapted for support on a floor surface or the like, said base having relatively low-height side panels defining a shower flow area having a drain,

an open-sided framework supported on said base and including laterally opposite side frames each of which has an upstanding front corner post, an upstanding rear corner post, and an upper hand rail connected at either end to the upper ends of the corresponding front and rear corner posts and being disposed at a height approximating the waist height of a human being so as to enable a person to enter the shower area while grasping said upper hand rails,

liquid impermeable disposable liner means adapted to overlie said shower area and be removably supported by said framework so as to substantially enclose the periphery of said shower area to substantially waist height,

an elongated support rod mounted on each of said side frames in generally parallel outwardly spaced relation from the corresponding upper hand rail so as to facilitate grasping of said hand rails without interference by said support rods,

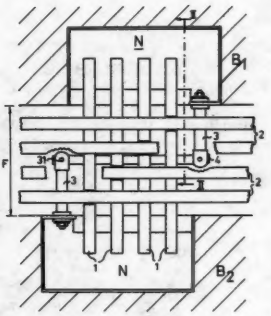
and a plurality of discrete shower nozzle assemblies mounted on each of said support rods, each shower nozzle assembly including support means selectively positionable along the length of the corresponding support rod, an elongated tubular nozzle rod supported by each support means so as to extend therefrom in cantilever fashion and being adapted for connection at one end to a fluid supply, each of said nozzle rods being rotatable and slidable about its own axis relative to its corresponding support means and rotatable together with its support means about the axis of the corresponding support rod while said nozzle rods are maintained in a plane substantially perpendicular to said support means, and a spray nozzle supported on the other end of each of said nozzle rods in fluid communication with the corresponding fluid supply so as to enable selective fluid discharge therefrom, said spray nozzles being selectively positionable to impinge fluid onto a patient disposed within said shower area from various angular directions.

4,566,143

BRIDGING SYSTEM FOR EXPANSION GAPS

Heinz Honegger, Wil, and Josef Ganz, Flaach, both of Switzerland, assignors to Honel Holding AG, Bulach, Switzerland

Filed Dec. 10, 1984, Ser. No. 679,731
Claims priority, application Austria, Dec. 9, 1983, 4292/83
Int. Cl.⁴ E01D *19/06*
U.S. Cl. 14—16.5 **18 Claims**



1. A gap bridging system for expansion gaps in roadways comprising: elastic sealing strips extending transversely to the longitudinal direction of the roadway, each of said sealing strips being arranged between spaced parallel bearers, the upper surfaces of which are level with the surface of said roadway and each of which bearers is connected to a crosspiece, said crosspieces being arranged in groups and supported in a manner to permit them to move longitudinally in recesses located beneath the roadway on both sides of said gap, the movement of said crosspieces being effected by a connecting rod, the ends of which are secured to opposite sides of said gap, said connecting rod passing through said crosspieces and a bearing incorporated in each of said crosspieces supporting said connecting rod such that it can pivot and move axially.

4,566,144

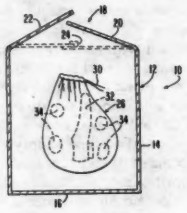
APPARATUS FOR BUFFING ARTICLES

Howard M. Arneson, Koch Rd., Corte Madera, Calif. 94925

Filed Jun. 9, 1983, Ser. No. 502,433
Int. Cl.⁴ A47L *23/00*
U.S. Cl. 15—3 **8 Claims**

1. Buffing apparatus comprising: a container; a flexible bag for placement in the container and adapted for receiving an article capable of being buffed, said container adapted to be placed in a shiftable bin and moved about relative to a predetermined reference as the bin is shifted, there being a flexible,

hollow element for placement in the bag and having a buffing surface engageable with the article in the bag, said element adapted to receive and contain a material, said container being



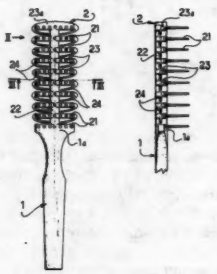
of a size to permit the bag, the element and the article to move relative to the container as the container is moved relative to said reference.

4,566,145

HAIRBRUSH

Jean-Louis Wachtel, Selestat, France, assignor to Celluloid S.A., France

Filed Jun. 19, 1984, Ser. No. 622,274
Claims priority, application France, Jun. 23, 1983, 83 10415
Int. Cl.⁴ A46B *1/00, 15/00*
U.S. Cl. 15—201 **7 Claims**



1. A hairbrush including a handle, a head connected to said handle and having a face from which protrude pins for brushing the hair, said head being constituted by a longitudinal portion coaxial with said handle and by a plurality of bars extending from either side of said longitudinal portion in spaced arrangement with respect to one another along said portion, said protruding pins being located on said bars and said space defined between two consecutive bars being adapted to receive a hair lock during the brushing operation;

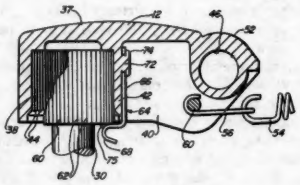
wherein each bar includes a flexible tongue protruding in each space between two consecutive bars located on a same side of said longitudinal portion and having a free end directed towards said longitudinal portion, each flexible tongue being arranged so as to guide therealong the hair lock into said space during the brushing operation and to hold it between its free end and the adjacent bar confronting it.

4,566,146

RETAINER CLIP FOR A WIPER ARM

William H. Harbison, Gary, Ind., assignor to The Anderson Company of Indiana, Michigan City, Ind.

Filed Apr. 30, 1984, Ser. No. 605,052
Int. Cl.⁴ B60S *1/34*
U.S. Cl. 15—250.34 **7 Claims**



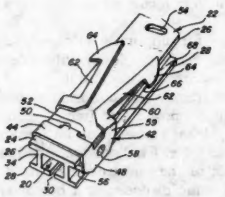
3. In a wiper arm having a mounting head, a channel shaped portion pivotally secured to the mounting head, an extension secured to the channel shaped portion and having means for removably connecting the wiper arm to a wiper blade, a socket in the mounting head; a chamber in the mounting head separated from the socket by a common wall, and retainer means in said chamber and extending into overlapping relation with said socket, the improvement characterized by said retainer means having a body portion and a latch portion, the body portion having one end portion staked to said common wall in said chamber for holding a major portion of said retainer means resiliently against said common wall, the latch portion comprising a rounded hook shaped member with a curved portion of the shaped member overlapping said socket, and means struck from the curved portion of the hook shaped member to provided a planar tab extending transverse to the axis of the socket and overlapping a portion of the socket.

4,566,147

CLIP FOR A WIPER BLADE REFILL

Philip M. Baerenwald; Michael G. Mohnach, both of Valparaiso, and John J. Plisky, Munster, all of Ind., assignors to The Anderson Company of Indiana, Michigan City, Ind.

Filed Oct. 25, 1984, Ser. No. 664,698
Int. Cl.⁴ B60S *1/38*
U.S. Cl. 15—250.42 **6 Claims**



1. A refill unit for removable attachment to a superstructure to form a windshield wiper blade, the refill unit having a resilient wiping element and a backing member carried by the wiping element, and said superstructure having at least two articulated holders with at least one of the holders having claws engaging flanges on said backing member, the improvement comprising clip means having a body portion and spaced downturned side portions engaging the flanges on the backing member, a tab projecting downwardly from a midportion of the body portion and engaging in one of at least two longitudinally spaced apertures in the midportion of the back of the backing member, detents and lugs on each side portion and

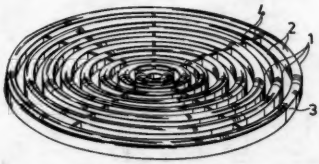
seating below the plane of the flanges, a pair of legs connected to the side portions and lying in a plane generally common with the plane of the body portion, latch means on each leg lying in the plane of the leg and extending outwardly beyond the side flanges, the claws on the at least one holder seating between the latch means and the side portions of the clip for holding the superstructure assembled on the refill.

4,566,148

DEVICE FOR SCRAPING OFF LIQUID

Oskar L. Rolin, 45, Chartwell Ct., Brighton, Sussex BN1 2EX, England

Filed Nov. 21, 1983, Ser. No. 554,022
Claims priority, application Sweden, Nov. 26, 1982, 8206765
Int. Cl.⁴ B05C *21/00*
U.S. Cl. 15—257.05 **9 Claims**



1. A device positioned in a liquid container for scraping liquid from a tool such as a brush, roller or the like, when the tool is dipped into and withdrawn from the container, the device comprising:

a body comprising a plurality of spaced apart co-planar strips arranged in a parallel or coaxial relationship, each strip having a U-shaped cross-section for forming channel-like buoyant bodies subdivided by intermediate walls into different sections, convex surfaces of the U-shaped strips providing a grid-like scraping surface on the upper surface of said body, and the concave surfaces of the U-shaped strips being at least partially immersed in the liquid for maintaining the device buoyant within the liquid so that the scraping surface remains substantially level with the top of the liquid in the container.

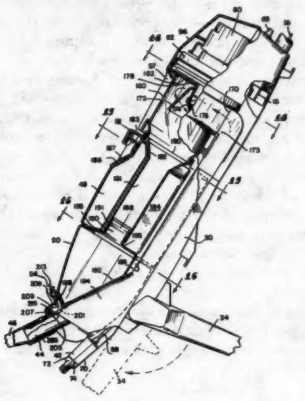
4,566,149

CAM LATCH FOR CLEANING DEVICES

Edwin Fitzwater, Rahway, N.J., assignor to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,548
Int. Cl.⁴ A47L *7/00*
U.S. Cl. 15—320 **14 Claims**

1. In a cleaning device having a liquid container removably mounted in said cleaning device, the improvement comprising: a collar receiving the top of said container; a cam having a rotatable camming surface engaging the bottom of said container, rotatably mounted on said cleaning device for moving said container into said collar by rotating said cam from a first to a second position; and latch means engaging said cam to



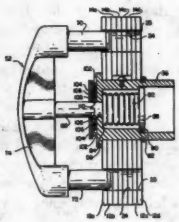
lock said cam in said second position to retain said container in said collar.

4,566,150

LADDER HINGE AND MULTI-POSITION LOCKING MECHANISM THEREFOR

Leland H. Boothe, Alpine, Utah, assignor to Little Giant Industries, Inc., Provo, Utah

Continuation of Ser. No. 333,229, Dec. 21, 1981, Pat. No. 4,407,045. This application Oct. 3, 1983, Ser. No. 538,475
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.⁴ E05D *11/10*
U.S. Cl. 16—332 **5 Claims**



1. An improved hinge for collapsible ladders, said hinge being of the type wherein first and second members are pivotally engaged for rotation about a pivot axis extending generally perpendicularly through said members and having respective locking apertures which are radially spaced from the pivot axis and can be selectively aligned and misaligned by rotation of said first and second members about the pivot axis, and at least one locking pin which is selectably translated through the locking apertures, when aligned, between an unlocked and a locked position so as to prevent mutual rotation of the first and second members, the improved hinge further comprising:

a hub member having a longitudinal axis corresponding to the pivot axis and having a guide aperture defined therein about the longitudinal axis, said hub member having an annular recess formed thereon;

a guide shaft disposed in the hub member for both axially slidable translation between extended and retracted posi-

tions along the longitudinal axis through the guide aperture and rotation about the longitudinal axis;

a handle member securing together the guide shaft and a proximal end of the locking pin;

axial detent means for selectively maintaining the guide shaft in the extended position while permitting rotation of the guide shaft, the detent means comprising:

a at least one detent bore defined through said hub member the location of the annular recess formed in the hub member and at least one detent recess, configured so as to be capable of receiving a spherical detent member, defined in said guide shaft such that said at least one detent bore and said at least one recess are axially aligned when the guide shaft is in the extended position said spherical detent member disposed in the at least one detent bore and having a projective portion for engaging the first detent recess; and

spring means disposed in the at least one detent bore for urging the projecting portion of the detent member radially toward the detent recess disposed in said guide shaft; an annular ring disposed in said recess, so as to hold said spring means disposed in said at least one detent bore in position.

4,566,151

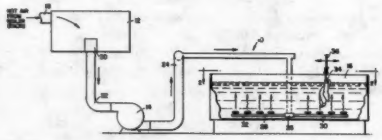
POULTRY DEFEATHERING APPARATUS AND PROCESS

Sanford E. Warren, 531 Mill St., Morton, Miss. 39117

Filed Sep. 15, 1983, Ser. No. 532,310

Int. Cl.⁴ A22C *21/04*

U.S. Cl. 17—47 **5 Claims**



1. Poultry defeathering apparatus for defeathering fowl in a body of water heated by boiler-generated steam, comprising:

a heat exchange means coupled to said boiler for heating a supply of air by transferring to said air supply a predetermined quantity of heat from the flue gasses emanating from the boiler;

hot air mixing means in fluid communication with said heat exchange means for receiving heated air from said heat exchange means, and vent means for introducing ambient air into said hot air mixing means in order to cool said heated air to reduce its heat energy to an appropriate level;

a water filled scalding tank for scalding fowl carcasses drawn through said tank;

a blower means in fluid communication with said hot air mixing means for receiving heated air from said mixing means, increasing the volumetric rate of flow of said heated air and increasing the temperature of the heated air received from said mixing means; and

hot air dividing means in fluid communication with said blower means for receiving heated air from said blower means said dividing means located at a level below fowl in said scalding tank and coupled to said heat exchange means for injecting said heated air into said water to further heat and to agitate said water and said fowl.

5. An improved process for defeathering fowl in a body of water heated by boiler-generated steam, comprising the steps of:

heating a supply of air by transferring to said air supply a predetermined quantity of heat from the flue gasses emanating from said boiler;

mixing the heated air with ambient air to reduce the temperature of the heated air to an appropriate level;

increasing the volumetric flow rate of the heated air;

increasing the temperature of the heated air; and

injecting said heated air into said body of water at a level below the fowl in said water to agitate and further heat said water and said fowl.

4,566,152

METHOD OF REMOVING FLOCKS FROM FIBER BALES

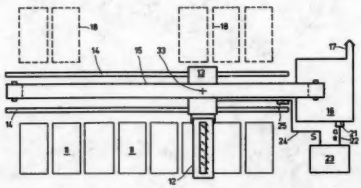
Marcel Zuend, Winterthur, Switzerland, assignor to Rieter Machine Works, Winterthur, Switzerland

Filed Apr. 12, 1983, Ser. No. 484,421

Claims priority, application Switzerland, May 4, 1982, 2719/82

Int. Cl.⁴ D01G *7/06, 13/00*

U.S. Cl. 19—81 **12 Claims**



1. A method of removing flocks from at least one series of fiber bales disposed along a support surface, said method comprising the steps of

moving a flock removal member to and fro in a sequence of passes over the fiber bales;

lowering the flock removal member for each pass over the fiber bales;

feeding the removed flock into a storage receiver at a first quantity of weight per unit of time;

transporting the flock in the storage receiver to a processing stage at a second quantity of weight per unit of time less than said first quantity;

generating a stop signal for stopping said feeding step in response to the receiver reaching a maximum level of fill;

generating a start signal for re-starting said feeding step in response to the receiver reaching a minimum level of fill;

determining an operating time interval (Ta) lasting from one start signal to a succeeding stop signal and a non-operating time interval (Ts) lasting from each stop signal to a succeeding start signal;

comparing each said operating time interval with a non-operating time interval in a given operating cycle to obtain a monitoring signal (y) dependent on said time intervals of said cycle;

comparing each monitoring signal with a predetermined reference signal and forming a control signal in response to a difference between said monitoring signal and said reference signal; and

adjusting the movement of the flock removal member in response to said control signal to control the weight of the flock removed from the fiber bales per unit of time.

4,566,153

UNIVERSAL TEXTILE MACHINE FOR OPTIONALLY MANUFACTURING LONGITUDINALLY ORIENTED OR RANDOMLY ORIENTED FIBRE FLEECES

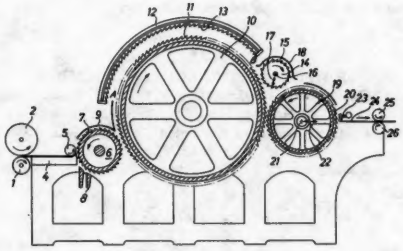
Werner Frosch, Schwanewede, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 650,321

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3334912

Int. Cl.[4] D01G *15/12, 15/46*

U.S. Cl. 19—98 7 Claims



1. A universal textile machine for optionally manufacturing a longitudinally oriented or a randomly oriented fibre fleece, comprising:

a main cylinder and associated carding elements;

a fibre feed-in-mechanism;

a doffer roller adjacent said main cylinder;

an additional intermediate roller furnished with a card clothing and located close to the contacting area of said main cylinder and said doffer roller upstream of the fibre flow;

a setting mechanism for varying the clearance between said doffer roller and said main cylinder, said intermediate roller being shiftable into two positions, in the first of said two positions the intermediate roller cooperating with both said main cylinder and said doffer roller, and in the other of said two positions the intermediate roller being distant from said main cylinder and said doffer roller, said doffer roller being distant from said main cylinder in said first position of the intermediate roller, and said doffer roller adjoining said main cylinder in said second position of the intermediate roller, and said main cylinder and said intermediate roller having the same direction of rotation.

4,566,154

NONWOVEN WEB SPREADER

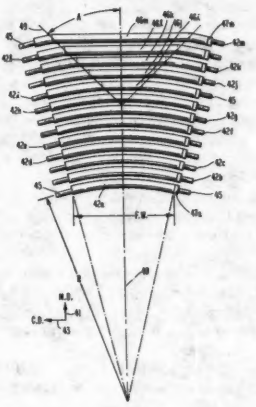
Leonard W. Streeper, Minotola, and Joseph R. Chille, Collingslake, both of N.J., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 2, 1983, Ser. No. 519,635

Int. Cl.[4] D01G *25/00;* D06C *3/06*

U.S. Cl. 19—296 8 Claims

1. For use in an apparatus for forming a nonwoven fibrous web, an improved web spreading device comprising a set of spreader rolls, spaced from each other in a machine direction of web formation and having axles extending generally in a cross-machine direction of web formation, characterized in that the spreader rolls comprise an upstream group of curved rolls and a downstream group of rolls, each roll in the downstream group having a straight central region and opposed curved end regions, the length of each central region being less than or equal to the length of the central region of its adjacent downstream spreader roll whereby fibers that have passed



over a straight central region are not subjected to further spreading by a more downstream roll.

4,566,155

SEPARABLE SPRING-LATCHED CUFFLINK WITH TRANSVERSALLY PRESSABLE RELEASE LEVER

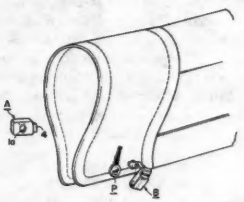
Hideo Kurashima, 5-12, Negishi 1-chome Taito-ku, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,909

Claims priority, application Japan, Jun. 1, 1983, 58-83478[U]

Int. Cl.[4] A44B *5/00*

U.S. Cl. 24—41 3 Claims



1. A separable, spring-latched cufflink with a transversally pressable release lever, said cufflink comprising:

a link member including a shank with a head provided at one end thereof and a cuff-engaging flange provided at an opposite end thereof;

said shank, being said head thereof, being of non-circular, elongated transverse cross-sectional shape so as to have a predisposed angular orientation relative to a set of shirt cuff button holes when inserted therethrough;

means providing a pair of two diametrically opposed, laterally outwardly opening grooved in said head of said shank, these grooves being oriented generally crosswise of said shank;

means defining a shoulder on said shank constructed and arranged for limiting incursion of said head into an opening;

a decorative member including a base plate having means defining an opening therethrough which is constructed and arranged to receive said head of said shank up to said shoulder means;

a decorative shell mounted to said base plate so as to frontally cover said decorative member externally of a shirt cuff against which said decorative member becomes abutted when in use;

a spring mounted on said base plate and covered by said decorative shell;

said spring comprising a resilient wire which is heart-shaped at one end and has two laterally spaced, generally parallel limbs integrally extending therefrom as intermediate portions thereof, these limbs terminating in obliquely angled-out feet an an opposite end of said spring, said spring at said one end being thereby provided with a medially located detent;

two pins mounted to said base plate medially thereof so as to extend within said decorative shell in the thickness direction of said decorative shell, near opposite ends of said shell;

one of said pins, located externally near one end of said decorative member engaging said spring within said recess of said spring;

means defining a slot into said decorative member at said opposite end thereof;

a push lever having means defining a medially located slot therein by means of which said push lever is penetrated by the other of said pins and held thereby for limited movement transversally of said decorative member;

said push lever having an end portion extending out of said decorative member through said slot in said opposite end of said decorative member;

means defining two divergent, laterally outwardly facing opposite side cam surfaces on said push lever within said decorative member, respective ones of these cam surfaces being in engagement between and with respective feet of said spring, so that while said push lever remains unpushed, said limbs of said spring remain disposed in partially obstructing relation with said opening through said base plate so that when said shank head, with said shank properly angularly oriented, is pushed into said opening, said spring legs are free to resiliently snap into said grooves in order to secure said cufflink together through the buttonholes of a shirtcuff, but so that said push lever when pushed, acting on said feet of said spring, temporarily cams the spring limbs apart sufficiently to permit said shank head to be withdrawn from said opening in order to detach said link member from said decorative member.

4,566,156

SLIDE FASTENER

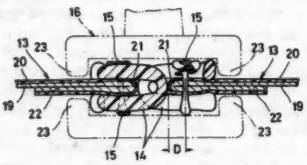
Hirotaka Sarasue, Ikoma, and Yoshitoki Tsubokawa, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 517,898

Claims priority, application Japan, Aug. 2, 1982, 57-117498[U]

Int. Cl.⁴ A44B *19/40*

U.S. Cl. 24—398 **2 Claims**



1. A slide fastener comprising:

(a) a pair of stringer tapes each including a tape of paper or nonwoven fabric and a first film of thermoplastic synthetic resin and mounted on one surface of said tape, each of said stringer tapes having a folded longitudinal strip with said first thermoplastic resin film facing outwardly;

(b) a pair of rows of coupling elements mounted respectively on said stringer tapes along said folded strips;

(c) a slider movably mounted on said pair of rows of coupling elements and having guide flanges, said thermoplastic resin films being slidably engageable with said guide flanges, said folded strips of the two stringer tapes jointly having a width at least equal to the maximum width of the slider; and

(d) a second film of thermoplastic synthetic resin sandwiched between and bonded to said folded strip and an unfolded portion of said stringer tape.

4,566,157

CLIP WITH SLIDING LOCKING MEMBER

Sven E. Packendorff, Näckrosvägen 7, S-445 00 Surte, Sweden

Filed Jun. 21, 1984, Ser. No. 622,791

Claims priority, application Sweden, Jun. 23, 1983, 8303624

Int. Cl.⁴ A44B *21/00*

U.S. Cl. 24—536 **5 Claims**

1. A substantially U-shaped clip having a web and two legs having upper and lower surfaces and edges, said legs protruding from the web, between which legs clothes or the like are placed, and furthermore having a locking member slidable along the legs and extending across the legs for clamping the legs to the clothes or the like, characterised in that the locking member is detachable from and attachable to the two legs and is substantially E-shaped, the intermediate cross-bar of the center pin of the E-section being adapted to project into a space formed between the legs and being slidable in this space between two end positions determined by abutment surfaces, said two legs each including a beveled portion extending from the upper surface on one leg toward an adjacent edge and from the lower surface on the other leg towards its adjacent edge to provide a locating at which said locking member may be installed on and removed from said legs.

4,566,158

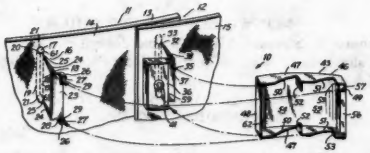
ADJUSTABLE BUCKLE

Wah Lau, 41-31 149th Pl., Flushing, N.Y. 11355

Continuation-in-part of Ser. No. 557,059, Dec. 1, 1983. This application Oct. 16, 1984, Ser. No. 661,450

Int. Cl.⁴ A41F *1/00*; A44B *11/10*

U.S. Cl. 24—580 **9 Claims**



1. An adjustable buckle comprising: a first member comprising means to attach said first member to a first material flap, and having engagement means oppositely disposed from said attachment means and means for effecting engagement with said engagement means at a plurality of positions; said means for effecting engagement comprising a base formed with teeth and a rim formed with teeth to cooperatively engage said base

teeth in said plurality of positions; a second member comprising means to attach said second member to a second material flap and having engagement means oppositely disposed from said second attachment means; and a cover formed so as to cover said first member; whereby said first member engages said second member in one of said plurality of positions of said first member so that the buckle secures the flaps in an overlying manner.

4,566,159

SAFETY CLASP FOR A NECKLACE OR BRACELET CHAIN

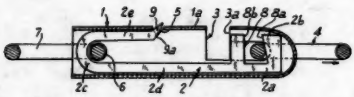
Jacques Leroux, 3 et 5 rue de la République, 60100 Creil, France

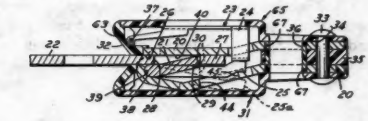
Filed Jul. 19, 1983, Ser. No. 515,120

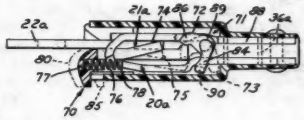
Claims priority, application France, Aug. 3, 1982, 82 13512

Int. Cl.⁴ A44B *13/00*

U.S. Cl. 24—599 **18 Claims**







1. A safety clasp for a necklace or bracelet chain, said clasp comprising two pieces sliding one in the other, one of said pieces comprising an outer sleeve to which a first end link of the chain is hooked, in its front part, and which is provided in its rear part with a slot for the introduction of a second end link of the chain, said slot being L-shaped with a transverse slot arm opening in the wall of the sleeve and a longitudinal arm extending in the direction of the rear part of the sleeve opposite to that where the first end link is hooked, the longitudinal arm portion of said slot terminating spaced apart from the rear end of said sleeve, said sleeve having a hole in its outer surface located between its front part and said slot, the other one of said pieces comprising a slide element housed inside said sleeve and adapted to move longitudinally with respect thereto, said slide element, in its rear part, having a notch for receiving the second end link of the chain, said notch opening laterally in the slide element and adapted to be brought opposite the transverse arm opening of the slot in the sleeve and in alignment therewith upon longitudinal movement of said slide element to allow the introduction of the second end link, said inner slide element presenting, in its front part opposite to that part where the notch is provided, an elastically deformable arm terminating in a tooth adapted to engage the hole in said sleeve for locking said pieces together, whereby when said slide element is moved longitudinally to a position of closure, said tooth is engaged in said hole for locking and said notch is positioned out of alignment with the transverse arm of the slot and in registry with the longitudinal arm of the slot in said sleeve, the second end link being retained by the rear edge of the notch in said sliding element within the longitudinal arm of the slot in said sleeve, and maintained spaced apart from the end of said longitudinal arm when said sliding element is in its position of closure.

4,566,160

END RELEASE INVERSE CLEVIS BUCKLE

James A. Gavagan, Centerline, and William E. Brennan, Troy, both of Mich., assignors to Irvin Industries, Inc., Rochester Hills, Mich.

Continuation-in-part of Ser. No. 253,200, Apr. 13, 1981, Pat. No. 4,413,385. This application Sep. 9, 1983, Ser. No. 531,272

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.⁴ A44B *11/25*

U.S. Cl. 24—637 **16 Claims**

1. A safety belt buckle characterized by a sheet metal loop formed clevis having apertured ends for attachment to a first belt end, a fully surrounded slot in the clevis loop end extremity, a connector having an apertured end for attachment to a second belt end and a tongue insertable through said slot into close proximity with one side of said clevis, said tongue having an apertured end adapted for latch engagement, a latch having a reaction end extending beyond both extremities of said slot pivotally seated against slotted and unslotted portions of said loop end extremity within said clevis adjcent said slot having a latch projection engageable with said tongue apertured end and said one side of said clevis, resilient means biasing said latch toward said engaging position deflectable in response to manual insertion of said tongue, and manually operable means including an end release push button to deflect said latch and resilient means to a tongue releasing position.

4,566,161

BUCKLES FOR VEHICLE SEAT BELT SYSTEM

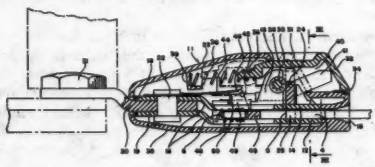
Roger A. Ashworth, Thursby; Brian E. Aiston, Wigton, and John D. Temple, Carlisle, all of England, assignors to ASE (UK) Limited, Carlisle, England

Continuation of Ser. No. 67,521, Aug. 17, 1979. This application Dec. 4, 1981, Ser. No. 327,592

Claims priority, application United Kingdom, Aug. 17, 1978, 33743/78

Int. Cl.⁴ A44B *11/26*

U.S. Cl. 24—642 **39 Claims**



1. A buckle for use in a vehicle seat belt system comprising tongue means and cooperating socket means;

said tongue means having a tongue and a latch formation on the tongue, and

said socket means having means providing a socket for receiving said tongue therein,

latch means having a latching position extending into said socket for engagement with said latch formation to latch said tongue within said socket, said latch means being movable from said latching position to a release position out of engagement with said latch formation to permit said tongue to enter and leave said socket,

first spring means urging said latch means to said latching position thereof,

ejector means slidably received in said socket and engageable by said tongue on entry into said socket,

second spring means acting on said ejector means to oppose movement thereof with said tongue on entry thereof into said socket and to thereby provide a force for ejection of said tongue from said socket,

antilatching means movable to a condition retaining said latch means in said release position thereof on movement of the latch means to said release position thereof, and

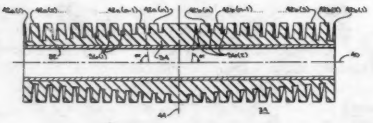
means on said ejector means engageable with said antilatching means on movement of said ejector means with said tongue on entry thereof into said socket to move said antilatching means to a second condition permitting movement of said latch means by said first spring means to said latching position to latch said tongue within said socket.

4,566,162

STRETCHER/EXPANDER ROLLER

George Brands, Wilmette, Ill., assignor to American Roller Company, Union Grove, Wis.

Continuation of Ser. No. 436,842, Oct. 26, 1982, abandoned.
This application Oct. 15, 1984, Ser. No. 660,261
Int. Cl.[4] D06C *3/06*
U.S. Cl. 26—105 2 Claims



1. A stretcher/expander roller for cross-stretching and separating the constituent strips of a slit web, comprising:

(a) a rigid inner core suitable to be rotationally mounted downstream from where the web is slit; and

(b) an elastomeric covering around said rigid core, said elastomeric covering defining a generally cylindrical exterior surface having a constant outer diameter and which is suitable for rolling contact with the slit web;

(c) wherein at least one pair of helical grooves are formed in the exterior surface of the elastomeric covering, each of said helical grooves subtending a slant angle θ with a line which is perpendicular to the roller axis and each of said grooves spiraling outwardly away from the center of the roller;

(d) wherein the helical grooves are inclined outwardly at an acute depth angle α away from the center of the roller, said depth angle α being constant from the center of the roller to the ends and said helical grooves defining a corresponding number of continuous helical lands of elastomeric material which are inclined outwardly away from the center of the roller at said acute depth angle α; and

(e) wherein the depth of each helical groove increases progressively from the center to the adjacent edge of the roller so that the lands are increasingly flexible from the center to the ends of the roller.

4,566,163

AUTOMATIC SUPERVISORY SYSTEM FOR A WARPER

Syozaburo Makino, Kawasaki; Keiji Yoshikawa, Yokohama, and Tukayo Nakasho, Nishikasugai, all of Japan, assignors to Nippon Selen Co., Ltd., Kanagawa, Japan

Filed Mar. 23, 1984, Ser. No. 592,588
Claims priority, application Japan, Jun. 21, 1983, 58-111412
Int. Cl.[4] D02H *13/08*
U.S. Cl. 28—187 1 Claim

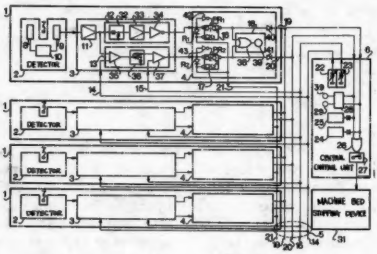
1. An automatic supervisory system for a warper comprising:

at least one detection unit; and

a central control unit;

said detection unit comprising a detector provided for each yarn to be wound on a warp beam to convert a variation in diameter of the yarn into an electrical signal, an amplifier including a yarn run signal discrimination circuit and a double ends signal discrimination circuit which serve to separate an output signal of said detector into a yarn run signal and a double ends signal, and a priority indication device including an end break priority circuit and a double ends priority circuit respectively receiving output signals from said yarn run signal discrimination circuit and double ends signal discrimination circuit, a logical operation circuit for indication and an indicator;

said central control unit comprising a switching mechanism for actuating a warping bed stopping device by means of an output signal from said detection unit, an end break indicator for indicating the occurrence of end break of a yarn and a double ends indicator for indicating the occurrence of double ends of a yarn, an end break counter for counting the number of end breaks which occurred and a double ends counter for counting the number of locations of doubles ends which occurred, and a control power source for variably setting the waveform shaping of said double ends signal discrimination circuit in said amplifier of said detection unit;



wherein upon the occurrence of end break or double ends of said yarn, said end break priority circuit or double ends priority circuit carries out the priority indication depending upon an output signal from said end break priority circuit or double ends priority circuit in said priority indication device to cause said end break counter or double ends counter to carry out the counting operation, and said indicator in said priority indication device selectively carries out the priority indication of said detection unit which has detected the end break or double ends and concurrently operates said warping machine bed stopping device through said switching mechanism.

4,566,164

APPARATUS FOR CONNECTING ELECTRICAL CONNECTORS TO FLAT MULTI-CONDUCTOR CABLE

Christopher K. Brown, Camp Hill; Lex D. Kensinger, Annville; Gregory S. Klopp, Hummelstown; Alden O. Long, Jr., Carlisle; Carl L. Moyer, Mt. Penn; William R. Over, Harrisburg, and Herman D. Walter, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

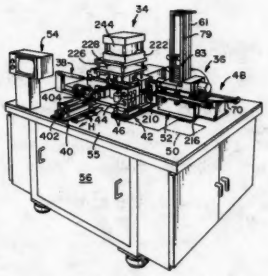
Filed Feb. 8, 1985, Ser. No. 699,963
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—33 M 19 Claims

1. Apparatus for connecting to the conductors of a flat multi-conductor cable, electrical connectors having electrical terminals provided with cable conductor receiving portions, the apparatus comprising:

a base;

connector orienting means on the base, for placing electrical connectors at loading locations in different selected orientations;

a press on the base, for inserting the cable conductors into said conductor receiving portions;
means for feeding the cable intermittently through the press;
a shuttle for receiving connectors from said loading locations and being movable on the base along a path extending between the orienting means and the press;
means for loading connectors at said loading locations into the shuttle in said selected orientations;



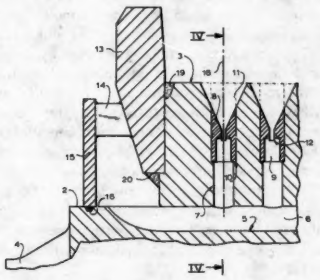
means for inserting connectors in the shuttle into the press in said selected orientations;
means for moving the shuttle between connector loading and connector insertion positions along said path; and
means for actuating the press to force the cable conductors into the conductor receiving portions of the terminals of connectors inserted into the press by the inserting means.

4,566,165

METHOD OF MANUFACTURING A CYLINDER FOR A SUGAR MILL

Jean-Pierre Georget, Douchy-les-Mines, France, assignor to Fives-Cail Babcock, Paris, France

Filed Oct. 27, 1983, Ser. No. 545,969
Claims priority, application France, Nov. 3, 1982, 82 18387
Int. Cl.[4] B02C *4/30*
U.S. Cl. 29—121.6 **6 Claims**



1. A method of manufacturing a cylinder having an exterior surface defining circular grooves of a cross section having the shape of a triangle, each triangle having an apex at a bottom of the groove in a respective transverse plane extending substantially perpendicularly to the axis of the cylinder, and the bottom of each groove being in communication with longitudinal channels extending substantially parallel to the axis in the cylinder, which comprises the sequential steps of

(a) first boring cylindrical radial channels in the cylinder in a plurality of the transverse plane until the radial channels are in communication with the longitudinal channels,

(b) fitting a plug having a blind hole at an inner end thereof in each one of the radial channels, the plugs having outer ends flush with the exterior cylinder surface and the blind holes being in communication with the longitudinal channels,

(c) cutting the circular grooves in the exterior surface of the cylinder and the plugs, the bottoms of the grooves extending into the plugs fitted into the radial channels, and

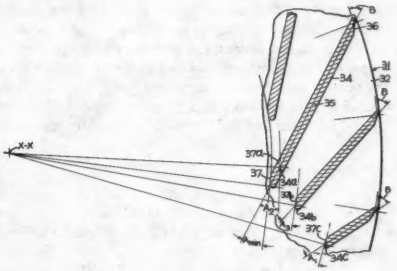
(d) making a circular slot in the bottom of each groove of a sufficient length to connect the bottom of each groove at the apex to the blind hole in each plug whereby the hole is opened and the bottom of each groove is in communication with a respective one of the horizontal channels.

4,566,166

METHOD FOR MANUFACTURING A STAY RING BEARING STATIONARY GUIDE VANES FOR A NONGATED TURBINE

Richard K. Donelson, Aurora, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 3, 1984, Ser. No. 657,256
Int. Cl.[4] B23P *15/02*
U.S. Cl. 29—156.8 R **7 Claims**



1. A method of manufacturing a stay ring adapted for a hydraulic turbine installation comprising:

forming a plurality of stay vanes;

securing said stay vanes to a ring member with said stay vanes circumferentially arranged on said ring member and extending axially therefrom with each of said vanes presenting a trailing edge on a radially inner portion of said vanes;

determining a desired discharge angle for said stay vanes based upon a predetermined desired angular momentum for fluid entering a runner of a given turbine installation;

trimming said trailing edge of said stay vanes an amount sufficient for said vanes to present said desired discharge angle.

4,566,167

METHOD FOR ASSEMBLY OF ANTI-STATIC SWITCH LOCK

Stanley C. Wolnirk, Broadview; Herbert Kincaid, Libertyville; Elbert M. Spencer, Wildwood, and Ronald L. Brown, Waukegan, all of Ill., assignors to The Eastern Company, Naugatuck, Conn.

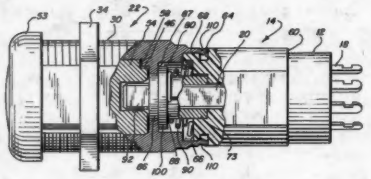
Division of Ser. No. 411,259, Aug. 25, 1982, Pat. No. 4,427,852.
This application Oct. 3, 1983, Ser. No. 538,338
Int. Cl.[4] B23P *11/00*; B21D *39/00*
U.S. Cl. 29—437 **6 Claims**

1. A method for assembling a switch lock of the type having a terminal assembly attached to one end of a hub, a lock assembly including a key-operated plug rotatable to operate the terminal assembly for switching and a barrel to receive the plug, said barrel having an end adapted to receive a portion of the other end of said hub, said method comprising:

inserting said portion of the other end of the hub into the barrel end to a limit defined by abutment of a radial stop

surface on the hub with a distal end of said barrel end and abutment of a distal end of the hub portion with a radial stop surface on the barrel end;

staking said barrel end directly to said hub portion to interconnect said hub and barrel, said hub end defining a radially opening recess intermediate said hub end stop surface and hub end distal end, said step of staking comprising radially inwardly deforming said barrel end into said



recess at a location spaced from said barrel end distal end to cause the deformed portion of the barrel end distal end to bear against the hub end at the edge of the recess most remote from said hub end stop surface and with the barrel end distal end abutting said hub end stop surface remaining substantially undeformed; and

positioning said key-operated plug in said barrel interconnected with the hub for operation of said terminal assembly.

4,566,168

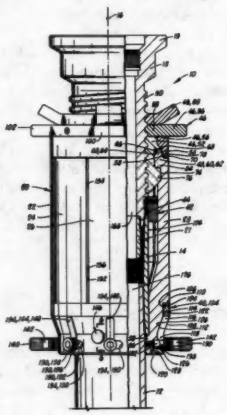
QUICK CONNECT ADAPTER

James L. Stromberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 9, 1985, Ser. No. 690,016

Int. Cl.[4] B21D *39/00*; F16L *39/00*

U.S. Cl. 29—517 **20 Claims**



1. A coupling apparatus for connection to a cylindrical member having a radially outward extending shoulder, said coupling apparatus comprising:

a body member;

a collet means including a plurality of collet fingers disposed around said body member, each of said collet fingers including a radially inward extending flange adapted to engage a longitudinally inward facing surface of said shoulder of said cylindrical member;

an actuating means, operably associated with said collet means, for moving said flanges of said collet fingers between a radially expanded open position and a radially contracted closed position;

annular seal means for sealing between said body member and said cylindrical member; and

adjustable collet positioning means, operably associated with said body member and said collet means, for adjusting a longitudinal position of said flanges of said collet fingers relative to said body member.

4,566,169

SET OF PARTS FOR BUILDING SMALL MACHINE TOOLS

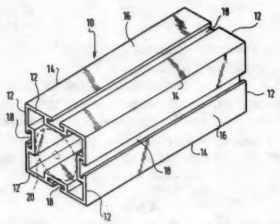
Gottfried Vesely, Groedig, Austria, assignor to Maier & Co., Hallein, Austria

Filed Dec. 9, 1983, Ser. No. 559,904

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1983, 3300553

Int. Cl.[4] B23B *47/00*

U.S. Cl. 29—560 **2 Claims**



1. A building set for small tool machines with at least a drive motor, a spindle stock and a support element for holding these parts, characterized in that the drive motor, the spindle stock and the support element are formed as independent parts, that the parts of the building set to be joined with one another each have a bearing surface in which at least one undercut clamping groove is formed, and in that the clamping grooves of two of the building set parts which are to be joined to one another are provided with an insertable connecting element which can be rigidly clamped in place in the clamping grooves by means of at least one tightening element, said connecting element consisting of two individual sections connected to one another the cross section of which sections corresponds to the cross section of a clamping groove, said connecting element further having at least two portions which are pivotal relative to one another by means of said tightening element about an axis perpendicular to the longitudinal direction of said sections, and said connecting element being formed of a unitary piece of plastic with said joint between said two portions being formed from a material bridge having a small thickness with respect to that of said portions.

4,566,170

METHOD OF PRODUCING A LIGHT EMITING DIODE ARRAY

Donald T. Dolan, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 10, 1983, Ser. No. 493,189

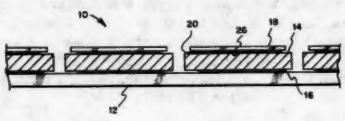
Int. Cl.[4] H01L *21/98, 33/00*

U.S. Cl. 29—569 L **5 Claims**

1. A method of producing a light emitting diode (LED) array, the steps comprise:

placing an adhesive upon a plurality of metallic pallets, placing a monolith composed of a semiconductor material

and having a plurality of LED sites thereon upon each of the metallic pallets so that adhesive is therebetween, cur-



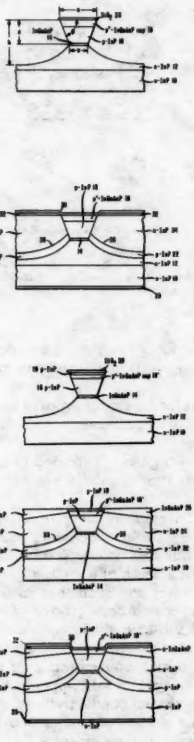
ing the adhesive and securing the metallic pallets with LED monoliths thereon end-to-end upon a substrate.

4,566,171

ELIMINATION OF MASK UNDERCUTTING IN THE FABRICATION OF INP/INGAASP BH DEVICES

Ronald J. Nelson, Berkeley Heights, and Randall B. Wilson, Maplewood, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 20, 1983, Ser. No. 505,993
Int. Cl.[4] H01L *21/20, 21/302*
U.S. Cl. 29—569 L **19 Claims**



1. A method of fabricating a buried heterostructure semiconductor device comprising the steps of:

(a) epitaxially growing a plurality of essentially lattice-matched semiconductor layers which include an InP/InGaAsP double heterostructure and at least one contact-facilitating layer on said heterostructure,

(b) forming a stripe masking layer on said contact-facilitating layer,

(c) etching said plurality of layers to form an elongated mesa under said masking layer, and

(d) regrowing at least one epitaxial layer along each side of said mesa, characterized in that

step (a) includes epitaxially growing and contact-facilitating layer of InGaAsP with a bandgap in the range of approximately 1.05–1.24 eV, and

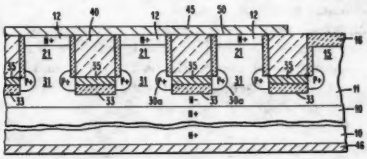
step (b) includes plasma depositing SiO_2 to form said masking layer.

4,566,172

METHOD OF FABRICATING A STATIC INDUCTION TYPE RECESSED JUNCTION FIELD EFFECT TRANSISTOR

Izak Bencuya, Needham, and Adrian I. Cogan, Waltham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 24, 1984, Ser. No. 583,512
Int. Cl.[4] H01L *21/425*
U.S. Cl. 29—571 **22 Claims**



1. The method of fabricating a junction field effect transistor comprising

providing a body of semiconductor material including a first layer of semiconductor material of one conductivity type of relatively low resistivity, a second layer of semiconductor material of said one conductivity type of relatively high resistivity contiguous said first layer, and a third layer of semiconductor material of said one conductivity type of relatively low resistivity contiguous said second layer, said first layer having a surface at a surface of the body;

forming a layer of a first protective material adherent to said surface;

forming a plurality of parallel grooves through said layer of first protective material and into said body of semiconductor material providing interposed ridges of semiconductor material, said grooves extending through said first layer of semiconductor material into said second layer of semiconductor material, each of said grooves having side walls formed by the adjacent ridges of semiconductor material and an end wall;

treating the body of semiconductor material to convert semiconductor material except at the surfaces of the ridges of semiconductor material protected by said first protective material to a second protective material thereby forming a layer of said second protective material at the side walls and end walls of said grooves;

removing the layer of said second protective material from the end walls of said grooves to expose said second layer of semiconductor material;

introducing conductivity type imparting material of the opposite conductivity type into said second layer of semiconductor material at the end walls of said grooves to convert zones of said second layer of semiconductor material to said opposite conductivity type, each of said zones having portions extending laterally toward the laterally extending portions associated with adjacent grooves to produce channel regions of the one conductivity type of relatively high resistivity between portions associated with adjacent grooves, the width of said channel regions

being less than the width of the semiconductor material of said ridges of semiconductor material;

removing semiconductor material of said zones of opposite conductivity at the end walls of said grooves to form extensions of said grooves, each of said extensions having side walls in said laterally extending portions of said zone and having an end wall;

converting regions of said zones of semiconductor material exposed at the end walls of said extensions of said grooves to said second protective material, said regions extending through said zones to underlying semiconductor material of said second layer of the one conductivity type to electrically isolate the laterally extending portions of each zone from each other;

applying conductive material to the end walls and to the side walls of the extensions of the grooves to form first electrical connections in ohmic contact with the laterally extending portions of the zones of the opposite conductivity type;

exposing semiconductor material of the one conductivity type of said first layer in said ridges of semiconductor material; and

applying conductive material to form a second electrical connection in ohmic contact with the semiconductor material of the one conductivity type of said first layer in said ridges of semiconductor material.

4,566,173

GATE INSULATION LAYER AND METHOD OF PRODUCING SUCH A STRUCTURE

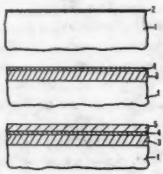
Werner Gössler, Herrenberg, Fed. Rep. of Germany; Anneliese Strube, Essex Jct., Vt., and Manfred Zurheide, Herrenberg, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1982, Ser. No. 384,855

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122382

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 29—571 **11 Claims**



1. A method of forming a gate insulation of an FET formed on a semiconductor substrate, comprising:

treating the substrate with a basic solution having up to approximately 400 ppb of aluminum, so as to deposit up to approximately 250 pg/cm^2 of aluminum on the substrate; and

oxidizing the substrate and said aluminum thereon in order to simultaneously form a first dielectric layer comprised of silicon dioxide on the substrate and a second dielectric layer comprised of aluminum oxide and silicon dioxide on said first dielectric layer, said second dielectric layer having a thickness of from about 1.0 to 1.5 nm,

whereby said second dielectric layer has an aluminum content sufficient to produce an upward threshold voltage shift of up to approximately 470 millivolts.

4,566,174

SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

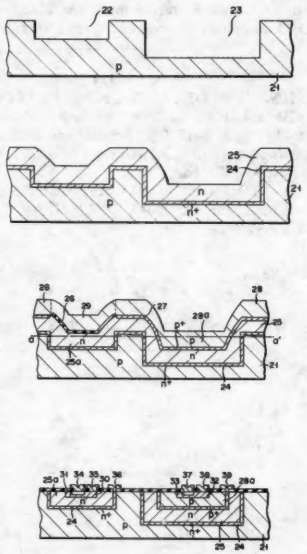
Seiji Yasuda, Yokohama; Yutaka Koshino, and Toshio Yonezawa, both of Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 26, 1983, Ser. No. 545,545

Claims priority, application Japan, Oct. 27, 1982, 57-188608

Int. Cl.⁴ H01L *21/76*

U.S. Cl. 29—576 W **6 Claims**



1. A method for manufacturing a bipolar semiconductor device comprising vertical npn and pnp transistors, comprising the steps of:

(a) forming at least a pair of grooves having different depths in a surface of a semiconductor substrate of a first conductivity type;

(b) diffusing a high concentration of impurity of a second conductivity type in a surface including said at least a pair of grooves;

(c) forming an epitaxial layer of the second conductivity type on said surface including said at least a pair of grooves such that said epitaxial layer has a thickness greater than a depth of a shallow groove of said at least a pair of grooves and such that an upper surface of said epitaxial layer in a deep groove of said at least a pair of grooves is substantially lower than said surface of said semiconductor substrate;

(d) diffusing a high concentration of impurity of the first conductivity type in said upper surface of said epitaxial layer of the second conductivity type after a mask layer is formed on a portion of said epitaxial layer which corresponds to said shallow groove;

(e) forming an epitaxial layer of the first conductivity type on said surface including said at least a pair of grooves;

(f) etching an entire surface to be level, to expose said surface of said semiconductor substrate, thereby to leave epitaxial layers of the first and second conductivity types in said at least a pair of grooves, respectively, said epitaxial layers of the first and second conductivity types having the same depth and width;

(g) forming a base region and an emitter in said epitaxial

layers in said at least a pair of grooves, respectively, thereby to form the npn and pnp transistors; and

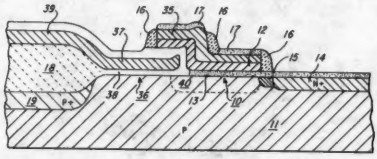
(h) forming base and emitter electrodes, each connected respectively to the base and emitter regions, and collector electrodes connected respectively to the impurity diffusion layers formed in the step (c) and the step (d).

4,566,175

METHOD OF MAKING INSULATED GATE FIELD EFFECT TRANSISTOR WITH A LIGHTLY DOPED DRAIN USING OXIDE SIDEWALL SPACER AND DOUBLE IMPLANTATIONS

Michael C. Smayling, Missouri City, and Michael P. Duane, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 30, 1982, Ser. No. 412,753
Int. Cl.[4] H01L *21/265, 21/308*
U.S. Cl. 29—576 B **8 Claims**



1. A method of making an insulated gate field effect transistor with a lightly-doped drain comprising the steps of:

(a) applying a conductive gate layer to a face of a semiconductor body, the gate layer being insulated from the face by a gate insulator, and patterning said gate layer to leave a conductive gate on said face,

(b) creating an oxide layer on said face extending over the top of the gate and over a sidewall of the gate,

(c) selectively removing the oxide layer from the face and from the top of the gate but leaving the oxide at said sidewall to produce a sidewall spacer, and thereafter

(d) introducing a first impurity of one conductivity-type into said face using the gate and sidewall spacer as masking to create a heavily-doped drain region in the face laterally spaced from the gate by a gap, the semiconductor body being of the opposite type, and

(e) implanting a second impurity of said one conductivity-type into said face and laterally diffusing the second impurity ahead of the first impurity to create a lightly-doped drain region beneath said sidewall spacer to bridge said gap,

(f) said first impurity having a much lower diffusion coefficient than the second impurity, the second impurity producing a graded junction, the first and second impurities not penetrating through said gate during said steps of introducing;

(g) wherein said steps of applying said gate layer, patterning said gate layer, creating said oxide layer, and selectively removing said oxide layer to leave said sidewall spacer, are all performed prior to said steps of introducing first and second impurities.

4,566,176

METHOD OF MANUFACTURING TRANSISTORS

Petrus M. A. W. Moors, and Teunis H. Uittenbogaard, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1984, Ser. No. 612,987
Int. Cl.[4] H01L *21/265*
U.S. Cl. 29—578 **5 Claims**

1. A method of manufacturing a high frequency bipolar transistor comprising the steps of

providing a first insulating layer on a surface of a collector region of a first conductivity type,

forming at least one aperture in said first insulating layer,

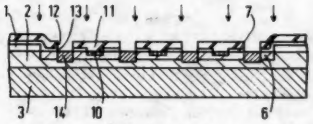
introducing dopant of a second conductivity type into said surface through said aperture in said first insulating layer to form a base region of said second conductivity type,

providing a second insulating layer at least on said base region,

forming a plurality of windows in said second insulating layer,

introducing dopant of said first conductivity type into said plurality of windows to form a plurality of emitter regions embedded into said base region,

providing a masking layer onto said second insulating layer and said plurality of emitter regions,



forming a second plurality of windows in said masking layer above said base region and exclusive of said emitter windows,

etching said second insulating layer at said second plurality of windows in said masking layer,

introducing dopant of said second conductivity type through said second plurality of windows to form a plurality of base contact zones in said base region, said base contact zones being more highly doped than said base region,

removing said masking layer, and

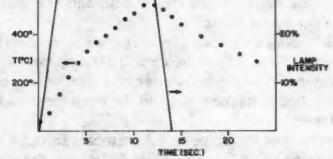
forming a plurality of emitter contacts contacting said plurality of emitter regions and a plurality of base contacts contacting said plurality of base contact zones through said first plurality of windows and said second plurality of windows respectively.

4,566,177

FORMATION OF ELECTROMIGRATION RESISTANT ALUMINUM ALLOY CONDUCTORS

Everhardus P. G. T. van de Ven, Muko, Japan, and Janet M. Towner, Palo Alto, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed May 11, 1984, Ser. No. 609,268
Int. Cl.[4] H01L *21/324, 21/477*
U.S. Cl. 29—590 **15 Claims**



1. A method of providing a semiconductor device with aluminum containing conductors of improved electromigration resistance, said method comprising;

(a) depositing, on a substrate of said device, a thin conductive layer of an alloy of aluminum containing at least 90% by weight of aluminum;

(b) heating said thus coated substrate to a peak temperature of 520° C.-580° C. from ambient temperature and then cooling said heated substrate to ambient temperatures all

within a period of 5 seconds to about 30 seconds by exposing said coated substrate to a source of heat capable of raising the temperature of said coated substrate to said peak temperature from ambient temperature and then allowing said thus heated substrate to return to ambient temperature all within the same period and

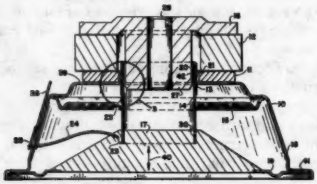
(c) forming a conductive pattern on said substrate by removing portions of said conductive layer from said substrate.

4,566,178

PROCESS FOR ASSEMBLING A CONE SPEAKER

William Hecht, Orange Park, and Pablo Reyes, Jacksonville, both of Fla., assignors to Phase Technology Corporation, Jacksonville, Fla.

Filed Dec. 28, 1984, Ser. No. 687,444
Int. Cl.[4] H04R *31/00*
U.S. Cl. 29—594 16 Claims



1. A process for assembling a cone speaker which comprises the steps of:

(1) attaching a truncated conical basket frame, having a open forward face and a closed rearward face with a passageway therethrough, to a flat ring-shaped forward plate having its central round opening smaller than and concentric to the passageway, and attaching to the forward plate a flat ring-shaped magnet with its central opening larger than and generally concentric to the central opening of the forward plate;

(2) inserting into the central opening of the forward plate a voice coil of electric wire wrapped spirally around the rearward portion of a tubular bobbin and spaced apart concentrically within the central opening of the forward plate by a removable voice coil shim means for accurately spacing the bobbin and voice coil;

(3) attaching the inside of a ring-shaped, flexible spider to the outside of the voice coil bobbin and the outside of the spider to the frame;

(4) attaching a truncated speaker cone at its small face to the forward end of the voice coil bobbin and its large face connected to the inner edge of a flexible skiver which is attached at its outer edge to the open forward face of the frame;

(5) removing the voice coil shim means through the central opening of the forward magnet plate and the central opening of the magnet;

(6) inserting into the central opening of the magnet and into the inside of the tubular coil bobbin the pole piece of a rearward magnet plate comprising a rear plate and a cylindrical pole piece projecting outwardly from one side of the rear plate, the pole piece being spaced apart concentrically from the inside of the bobbin by about 0.015 inch radially; and

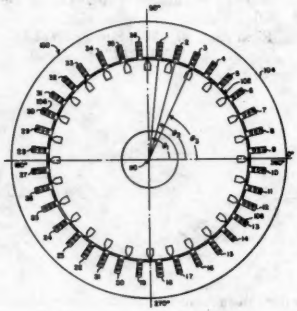
(7) attaching the rear plate to the upper face of the magnet.

4,566,179

CORE ELEMENT FOR ELECTRODYNAMIC ROTARY MACHINE

Carleton E. Sawyer, Littleton, and Hugh C. Masterman, Westford, both of Mass., assignors to Display Components, Inc., Westford, Mass.

Division of Ser. No. 495,962, May 19, 1983, Pat. No. 4,508,989.
This application Oct. 18, 1984, Ser. No. 662,391
Int. Cl.[4] H02K *15/00*
U.S. Cl. 29—596 13 Claims



1. A method of making a slotted core element for use in a ϕ-phase electrodynamic rotary machine of the type including a pair of magnetic core elements coaxially mounted and rotatable relative to one another about a common axis, said slotted core element including a plurality of slots "s" and a plurality of coil windings respectively wound in said slots, said slots and coil windings being circumferentially spaced in a predetermined pattern around said slotted core element about said common axis so that as said elements rotate relative to one another at a substantially constant speed in response to a balanced sinusoidal excitation signal, the particular energy distribution around said slotted core element will exhibit a sinusoidal pattern around said slotted core element, said pattern providing a peak value for each of said phases ϕ, said peak values of said phases being equiangularly distributed around said one core element, said method comprising the steps of:

forming said core element with said slots so that (1) said slots in each 90° quadrant of said one core element, defined by mutually perpendicular radial axes extending normal to said common axis, are nonuniformly angularly spaced within said quadrant and symmetrically arranged with corresponding slots in each adjacent 90° quadrant about the radial axis disposed therebetween so as to reduce the even harmonics in said energy field to substantially zero; (2) each of said 90° quadrants is divided into $90°/\phi$ segments; and (3) the slots in each of said segments are symmetrically arranged with slots in each of the adjacent segments about a radially-directed line between adjacent segments so as to reduce at least the third and fifth harmonics of said balanced sinusoidal field to substantially zero; and

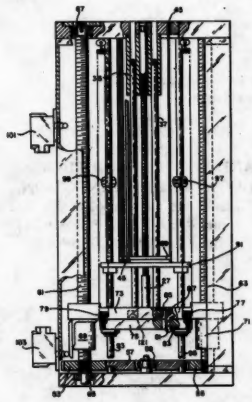
winding said coil windings in said slots so that the number of turns of each of the coil windings associated with each phase of said ϕ-phases are such that the $(6c+3)$ harmonics of said energy distribution for that phase are reduced to substantially zero, wherein c=any interger including zero.

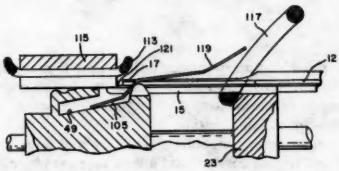
4,566,180

METHOD AND APPARATUS FOR PLACING COILS AND INTERMEDIATE INSULATORS IN CORES

Keith A. Witwer, Fort Wayne, and Robert G. Walker, Ossian, both of Ind., assignors to Industra Products, Inc., Fort Wayne, Ind.

Filed Sep. 30, 1982, Ser. No. 429,670
Int. Cl.[4] H02K *15/00;* B23P *19/00*
U.S. Cl. 29—596 23 Claims





1. In a coil placing machine for placing prewound coils in selected slots of a slotted dynamoelectric machine stator core the improved method of positioning insulating material within the core slots radially outwardly of at least some of the coils comprising the steps of:

initially moving both the insulating material and said at least some of the coils toward the core;

interrupting coil movement while continuing to move the insulating material into the core; and

resuming coil movement after insulating material placement has been accomplished to complete placing of the coils.

4,566,181

ROTATIONAL VIBRATORY VISCOMETER TRANSDUCER AND CIRCUIT

Frank J. Matusik, Piscataway, and Donald W. Nelson, Voorhees, both of N.J., assignors to National Metal and Refining Company, Ltd., Metuchen, N.J.

Division of Ser. No. 483,142, Apr. 8, 1983, Pat. No. 4,488,427.
This application Aug. 31, 1984, Ser. No. 646,696
Int. Cl.[4] H01F *41/00*
U.S. Cl. 29—602 R 3 Claims

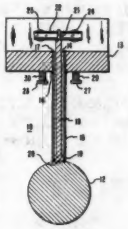
1. A method for manufacturing a transducer assembly for a torsional mode rotational vibratory viscometer, comprising the steps of:

providing a metal support plate having opposed major surfaces with a hole extending through the plate between said surfaces;

providing a hollow cylindrical metal sheath having torsional elasticity;

welding the outer surface of an upper end part of said sheath to said plate at the portions of both of said major surfaces adjacent said hole, so that said sheath is substantially coaxial with said hole;

securing an immersible tip member to a lower end part of said sheath below said plate;



providing a rigid cylindrical metal rod disposed within, spaced from and substantially coaxial with said sheath;

welding a lower end part of said rod to the lower end part of said sheath, so that said rod extends through said hole and has an upper end above said plate; and

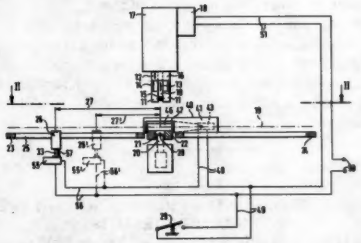
securing a metal crossbar comprising magnetically permeable material to the upper end of said rod.

4,566,182

ACTUATING ASSEMBLY FOR THE PRIME MOVERS OF RIVETING PRESSES AND THE LIKE

Gerd Altwicker, Eschweiler, and Wilhelm Eiringhaus, Stolberg, both of Fed. Rep. of Germany, assignors to William Prym-Werke KG, Stolberg, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 598,989
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313652
Int. Cl.[4] B23P *21/00;* B23Q *15/00;* D05B *3/12*
U.S. Cl. 29—715 18 Claims



1. A machine for the application of rivets and other articles of hardware to workpieces of textile or other material of the type having a marginal portion, comprising article supplying means; prime mover means actuatable to operate said article applying means; means for supporting the workpiece so that the workpiece is movable with reference to said supporting means and selected portions thereof can be located in the range of said article applying means; at least one first actuating means, said actuating means being stationary when the machine is in use and being activatable by an applied article on the workpiece and being disposed at a preselected distance from said article applying means such as corresponds to desired mutual spacing of two articles on the workpiece; at least one second actuating means activatable by the marginal portion of the workpiece and disposed at a predetermined distance from

said article applying means; and means for operatively connecting said first and second actuating means with said prime mover means so as to actuate said prime mover means in response to simultaneous activation of both said actuating means while the workpiece is held at a standstill with reference to said actuating means.

4,566,183

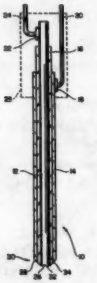
METHOD FOR MAKING BI-POLAR ELECTROCAUTERY NEEDLE

William G. Bloom, Menlo Park, and Gary I. Geschwind, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 272,853, Jun. 12, 1981, Pat. No. 4,483,338. This application Nov. 15, 1984, Ser. No. 672,444

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—825 **4 Claims**



1. The method for making a bi-polar electrocautery needle, the steps comprising:

providing an inner electrode;

stretching insulating-locking means over the inner electrode so as to axially expand and radially reduce the means;

placing an outer electrode over the means such that it is concentric with the inner electrode; and

recovering the insulating-locking means toward its unstretched condition, so that the means expands radially against both the inner and outer electrodes, locking the electrodes in fixed position relative to one another, spacing apart the electrodes, and electrically insulating the electrodes.

4,566,184

PROCESS FOR MAKING A PROBE FOR HIGH SPEED INTEGRATED CIRCUITS

J. Aiden Higgins, Westlake Village, and Emory R. Walton, Jr., Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 295,879, Aug. 24, 1981, abandoned. This application Nov. 19, 1984, Ser. No. 672,173

Int. Cl.⁴ H05K *3/34*

U.S. Cl. 29—840 **2 Claims**

1. A process of making a probe for integrated circuits, comprising:

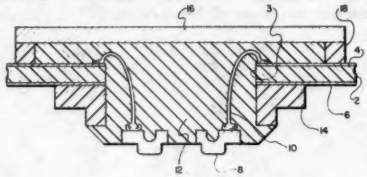
selectively etching a substrate to form a mold having a depression at a predetermined probe tip location;

depositing metal in said depression to form a probe tip;

placing a spacer on said substrate around said probe tip;

placing a board of insulating material on top of said spacer, said board having a conductive deposit on its surface and having a hole adjacent said probe tip which extends through said board;

bonding one end of a wire to said probe tip and the other end to said conductive deposit;



encapsulating said wires; and

removing said substrate.

4,566,185

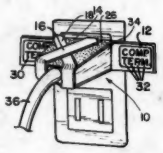
DEVICE AND METHOD FOR FIRMING-UP A PLUG-SOCKET CONNECTION

Horace Bryan, 12, Brighton La., Brooklyn, N.Y. 11235

Filed Jun. 4, 1984, Ser. No. 616,715

Int. Cl.⁴ H01R *13/639*

U.S. Cl. 29—845 **7 Claims**



1. A flexible plug-to-socket connection firming-up device partly foldable from an initially substantially flat and inoperative state to at least a partly folded operative state,

comprising in combination

attachment means including a carrier and adhesive means affixed to said carrier, said adhesive means being adapted to adhere at least to a socket holder, said carrier and said adhesive means including an adhesive strip extending along a longitudinal direction, and further including a backing material normally adhering to an external side of said adhesive strip, but being capable of readily being peeled off therefrom prior to the attachment of said carrier to said socket holder, and

connecting means having two major sides, and being connected to said attachment means, and including wrap-around means adapted to at least partially surround the plug, while substantially clearing a wire connected to said plug,

said wrap-around means including first and second flaps extending normally outwardly from said longitudinal strip on respective opposite elongated sides thereof, and being releasably securable to one another at least near respective ends thereof,

each flap including adhesion-enhancing means for facilitating adhesion of one flap to the other flap, while being substantially free from any adhesion-facilitating means enabling adhesion of one of said flaps to said attachment means, said adhesion enhancing means being applied to said first flap on a side thereof coinciding with one of said major sides, and being applied to said second flap on a side thereof coinciding with the other of said major sides,

at least one of said flaps being formed with a V-shaped or U-shaped recess so as to subdivide said one of said flaps into two elongated flap portions normally extending transversely to said longitudinal direction,

whereby, upon passing the plug from a side of the firming-up device opposite to said backing material through said

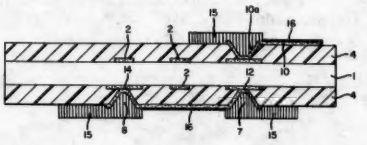
elongated adhesive strip, thereafter peeling off said backing material from said elongated adhesive strip, thereafter plugging the plug into the socket, thereafter attaching the elongated adhesive strip at least to a holder of the socket, thereafter crossing said flap portions over one another, so that one flap portion lies over the other flap portion, and connecting the adhesion enhancing means of the flap portions and of the remaining flap to one another, so as to wrap said flap portions at least partially around the plug, while substantially clearing said wire attached to the plug, the plug is restrained from being unintentionally unplugged from said socket.

4,566,186

MULTILAYER INTERCONNECT CIRCUITRY USING PHOTOIMAGEABLE DIELECTRIC

Charles E. Bauer, Cornelius, and William A. Bold, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 29, 1984, Ser. No. 626,560
Int. Cl.[4] H01K *3/10*
U.S. Cl. 29—852 **15 Claims**



1. A method of fabricating printed circuit boards having multiple predetermined conductor patterns, multiple dielectric layers between said conductor patterns and multiple predetermined points of interconnection between said conductor patterns and through said dielectric layers, the method comprising the steps of:

(a) forming a conductor pattern on a non-conducting substrate by applying a conductive polymer thick film to said substrate in a predetermined pattern and curing said film;

(b) applying a layer of photoimageable photopolymerizable dielectric material over said conductor pattern;

(c) forming a dielectric layer defining vias by selectively exposing in a predetermined pattern said layer of photoimageable photopolymerizable dielectric material;

(d) forming vias through said layer of dielectric material, by removing monomeric portions of dielectric material corresponding to said vias, said vias communicating with predetermined points of interconnection between conductor patterns;

(e) forming another conductor pattern on said dielectric layer and simultaneously forming conductive interconnections between conductor patterns and through said dielectric layer between conductor patterns by applying another conductive polymer thick film to said dielectric layer in a predetermined pattern whereby said vias are also coated with said conductive polymer thick film, and curing said film; and

(f) repeating steps (b) through (e) to form multiple electrically interconnected layers of circuitry separated by multiple layers of dielectric material.

4,566,187

METHOD FOR FIXING ELECTRIC CORD AND AN ELECTRICAL CONNECTOR

Kun S. Chen, No. 3, Alley 3, Lane 418, Hsin-Hsing Rd., Tainan City, Taiwan

Filed May 9, 1984, Ser. No. 608,650
Int. Cl.[4] H01R *43/00, 13/62, 33/05*
U.S. Cl. 29—857 **3 Claims**

1. A method of fixing an electric cord to an electrical connector, comprising the steps of:

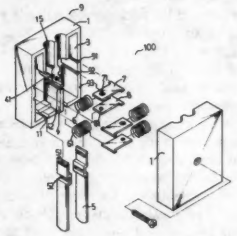
a. positioning a prong having a first slot and a second slot at an upper part thereof within a casing of said connector;

b. inserting a spring-loaded insulator-fixing plate into the first slot of said prong, said spring-loaded insulator-fixing plate having a toothed hole which allows a wire of said cord to pass through, said toothed hole being partially shielded by said prong when said prong is in a first position;

c. inserting a spring-loaded bare wire-fixing plate into the second slot of said prong, said spring-loaded bare wire-fixing plate having an aperture which only allows a bare conductive portion of said wire to pass through, said hole being partially shielded prong when said prong is in said first position;

d. moving said prong against spring bias from said first position to a second position and inserting said wire having said bare portion into the toothed hole of the insulator-fixing plate and the aperture of the bare wire-fixing plate;

whereby when said prong is moved to said second position with respect to said spring-loaded insulator-fixing plate and said spring-loaded bare wire-fixing plate, said toothed hole of said insulator-fixing plate and said hole of said bare wire-fixing plate will no longer be shielded by said prong so that said wire may pass through said toothed hole while the bare portion of the wire may pass through said hole, and when said prong is released to return to said first position a rubber covering of said wire will be clamped by the toothed hole and said prong while the bare portion of the wire will be clamped by said hole and said prong.



2. An electrical connector, comprising:

a casing the interior of which is divided into two chambers by a partition, said casing being provided on its top with two holes each communicating with one of said chambers and provided on its bottom with two passageways each communicating with one of said chambers;

two prongs respectively mounted into said two chambers in such a way that a lower part of each said prong extends out of said casing through one of said passageways, each said prong having an upper slot and a lower slot disposed at an upper part thereof;

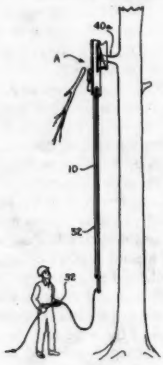
two insulator-fixing plates respectively inserted through the upper slots of said prongs and embedded at opposite ends of each plate into said casing, each said insulator-fixing plate being surrounded by a first spring and having a toothed hole which allows a wire to pass through, said first spring forcing a corresponding one of said prongs to shield a part of said toothed hole in a first position of the prong; and

two bare wire-fixing plates respectively inserted through the lower slots of said prongs and embedded at both ends in said casing, each said bare wire-fixing plate being surrounded by a second spring and having a hole which only allows the bare portion of said wire to pass through, said second spring forcing a corresponding one of said prongs to shield a part of said second hole in said first position, each said prong movable against spring bias to a second position to allow insertion of said wire through said holes in the associated insulator-fixing and wire-fixing plates.

4,566,188
POWER SAW PRUNING DEVICE

Teck A. Wilson, Seminole Point Rd., Fairplay, S.C. 29643

Filed Jul. 12, 1984, Ser. No. 630,106
Int. Cl.[4] B27B *19/09*
U.S. Cl. 30—166 A 22 Claims

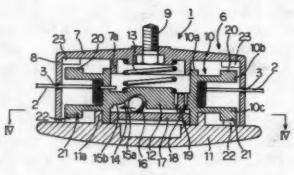


1. A power tree pruning device comprising:
an elongated pole for reaching overhead tree limbs having a first end and a second end;
base means carried by said elongated pole adjacent said first end for slideably carrying a power saw with a blade of said power saw extending to one side of said base;
rack means carried by said base means for carrying said power saw on said base and guiding said power saw in a one-dimensional sliding motion;
angle arm means carried by said base means opening outwards to a mouth for receiving a tree limb and tapering from said open mouth toward said base means;
said angle arm means tapering toward said base means to form a crevice between an edge of said angle arm and a surface of said base means in which said tree limb is gripped as said power saw blade cuts through said limb;
said angle arm means being offset on said base means to one side of said saw blade so that a stump of said tree limb remaining after said tree limb is cut is retained in said crevice whereby said angle arm means retains said pruning device suspended from said stump after the cut tree limb falls to the ground.

4,566,189
FILAMENT-TYPE TRIMMING APPARATUS

Goro Muto, 112-6 Futawa-cho, Funabashi-shi, Chiba, Japan

Filed Oct. 10, 1984, Ser. No. 659,264
Claims priority, application Japan, Oct. 15, 1983, 58-193192
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 14 Claims

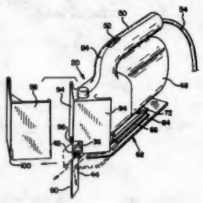


1. In a filament-type trimming apparatus comprising a casing having a base portion and a rim portion, a spool having a hub portion and upper and lower flanges, at least one filament wound on said spool and a cover releasably mounted to the lower end of the rim portion of the casing and adapted to support the spool, the improvements comprising:
a first engaging means for engaging the upper flange of the spool with the underside of the base portion of the casing when the spool is pressed upwardly against the action of a spring,
a second engaging means for engaging the lower flange of the spool with the upper surface of the cover when the spool is pressed downwardly by the action of the spring, and
a spool engaging and disengaging mechanism including a plurality of radially outwardly extending inclined ball guides in the form of a slot formed on the underside of a press member of the spool and a corresponding plurality of balls adapted to be moved along said ball guides by reason of centrifugal force generated responsive to the speed of rotation of the casing.

4,566,190
RECIPROCATING BLADE CUTTING DEVICE

Stig A. Isakson, 5751 SW. 54th, Portland, Oreg. 97221

Continuation of Ser. No. 524,929, Aug. 22, 1983, abandoned.
This application Feb. 4, 1985, Ser. No. 697,729
Int. Cl.[4] B23D *51/10*
U.S. Cl. 30—373 10 Claims



8. An attachment for mounting onto a conventional reciprocating blade saw having a reciprocating shaft, said attachment comprising; a housing body having a cylindrical seat formed therein, a guide cylinder fixedly contained within said seat and a reciprocating shaft slideably contained within said guide cylinder and having one end projected out of the guide cylinder and out of the housing body, a pair of guide surfaces on the housing body defining intersecting planes having an established angle therebetween, the extension of which angle encompasses the attachment and blade saw to which it is attached, and a chuck fastened to the exposed end of the reciprocating shaft, a planar saw blade having a linear cutting edge adapted to be mounted on the chuck to be reciprocated in line with the cutting edge and for cutting in a cutting direction perpendicular to the cutting edge, means for mounting a saw blade to the chuck in the plane defined by one of said guide surfaces with the cutting edge positioned along the line of intersection of the planes, means for mounting the housing body to the reciprocating blade saw and means for fastening the reciprocating shaft of the housing attachment to the reciprocating shaft of the reciprocating blade saw to be reciprocated therewith.

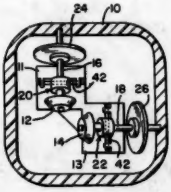
4,566,191
X-Y POSITION INDICATOR FOR A DISPLAY SYSTEM

John B. Moseley, Norfolk, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Apr. 18, 1984, Ser. No. 601,566
Int. Cl.[4] G01B *7/02*
U.S. Cl. 33—1 M 5 Claims

1. A position indicator device for use with a system for electronically representing the positional movement of said

position indicator device over a surface comprising: a housing adapted to be moved along said surface; a first position wheel rotatably mounted in said housing; a second position wheel rotatably mounted in said housing; the axes of said first position wheel and said second position wheel being in perpendicular planes; each position wheel being mounted on a separate rotatable shaft adjacent one end of said shaft, said shaft being loosely mounted in a wall of said housing axially spaced from



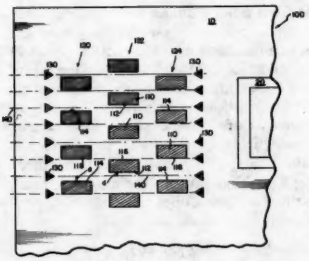
said wheel and spaced upwardly from the bottom of the housing; mechanical-to-electrical tranducers means actuated by rotation of each of said first position wheel and said second position wheel for generating electric signals indicating the amount of rotation of each of said wheels; and bias means mounted in said housing and resiliently urging each of said wheels toward said surface, said housing being constructed to permit a rim portion of each wheel to extend past the bottom of said housing into contact with the surface.

4,566,192

CRITICAL DIMENSION MEASUREMENT STRUCTURE

Kevin T. Hankins, and Anthony L. Rivoli, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 28, 1983, Ser. No. 566,399
Int. Cl.[4] G01B 5/00
U.S. Cl. 33—1 B **23 Claims**



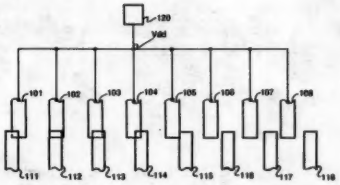
1. An apparatus for indicating dimensions of projected figures, comprising pattern means, disposed on a mask means for producing projected figures, for scaling dimensional variation of said projected figures from the dimensions of figures on said mask means, said pattern means including a plurality of spaced scaling figures disposed within said pattern means such that alignment of opposing edges of at least two of said scaling figures after projection from said mask means represents a measure of said dimensional variation, said aligning opposing edges scaling figures being offset from each other along the axis of alignment.

4,566,193

USE OF AN ELECTRONIC VERNIER FOR EVALUATION OF ALIGNMENT IN SEMICONDUCTOR PROCESSING

David E. Hackleman, Monmouth; Richard F. Adams, and Wayne P. Richling, both of Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 31, 1984, Ser. No. 636,480
Int. Cl.[4] G01B 7/00; G08C 21/00
U.S. Cl. 33—1 D **8 Claims**



1. A device for evaluating alignment of a first layer on an integrated circuit with a second layer on the integrated circuit, the device comprising:

a detecting means for electrically detecting misalignment between the first layer and the second layer, the detecting means including,

a first plurality of conducting material sections on the first layer, and

a second plurality of conducting material sections on the second layer, wherein each section of a first group of the first plurality of conducting material sections is electrically coupled to a corresponding section of a first group of the second plurality of conducting material sections, and each section of a second group of the first plurality of conducting material sections is electrically insulated from a corresponding section of a second group of the second plurality of conducting material sections; and

an output means, coupled to the detecting means for producing an output which is an encoded representation of a quantity of misalignment, wherein the output means detects which sections are within the first group of the first plurality of conducting material sections and which sections are within the second group of the first plurality of conducting material sections in order to produce the encoded representation of the quantity of misalignment.

4,566,194

PRESS PLATE POSITIONING APPARATUS FOR AUTOMATIC DRAWING MACHINE

Teruo Tsunoda, Nagareyama; Hiromitsu Numauchi, Higashikatsushika; Hironobu Kurata, Hiratsuka; Yoichi Kawaguchi; Satoshi Ishii, both of Yokohama; Masanori Seki, Kamakura; Masahiro Iwasaki, Fujisawa, and Fukumasa Enomoto, Yokohama, all of Japan, assignors to Komori Printing, Tokyo, Japan

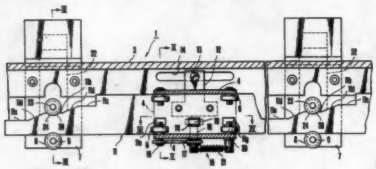
Filed Mar. 7, 1985, Ser. No. 709,160
Int. Cl.[4] G01B 5/25
U.S. Cl. 33—18.1 **8 Claims**

1. A press plate positioning apparatus for an automatic drawing machine so as to form punch holes at a punch hole forming edge of a press plate placed and fixed on a drawing board and draw registration marks at predetermined positions, comprising:

an elongated cam plate extending in parallel with a positioning edge of the press plate which extends from said drawing board and which is perpendicular to the punch hole forming edge, said elongated cam plate being moved by manual control means in a direction parallel to the positioning edge and being provided with a plurality or cam surfaces which are arranged in a longitudinal direction

thereof and each of which has a plurality of stepwise horizontal surfaces and at least one inclined surface connecting said stepwise horizontal surfaces; and

a plurality of positioning blocks, each of said positioning blocks being adapted not to be moved by block holding means with respect to the positioning edge, being biased



downward by block biasing means, being guided by block guide means together with a corresponding gripper block such that said each positioning block is vertically moved by a behavior of said cam surface upon reciprocal movement of said cam plate so as to bring the positioning edge into contact with one of stepwise vertical surfaces, and being locked by clicking means in position.

4,566,195

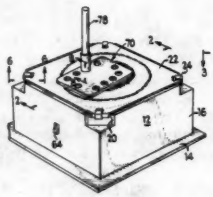
MAGNETIC DRAWING TOY

Ralph J. Kulesza, Chicago; Walter J. Wozniak, Addison; Harry Disko, South Barrington, and Burton C. Meyer, Downers Grove, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 17, 1985, Ser. No. 692,122

Int. Cl.[4] B43L *13/00*

U.S. Cl. 33—27.11 **9 Claims**



1. A design drawing toy comprising:

a housing;

a substantially flat platen supported atop the housing;

a motor positioned within the housing below the platen;

a rotating magnetizable shaft, the axis of which is substantially transverse to the plane of the platen, projecting up through the platen;

a magnet mounted for rotation with the shaft below the platen; and

a removable templet with at least a portion being magnetic and defining a periphery positionable over the platen with the periphery abutting the shaft.

4,566,196

VARIABLE POINT POSITION DETERMINING ARRANGEMENT

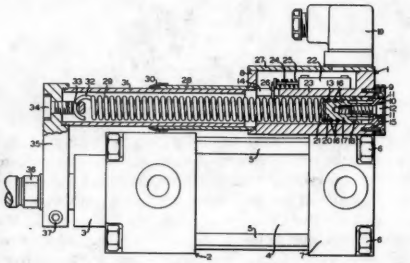
Walter Brausfeld, Hanover; Helmut Göttling, Isernhagen; Rudolf Möller, Gehrden; Peter Müller, Hanover, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,092

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331720

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—125 R **14 Claims**



1. A variable point position determining arrangement secured in a stationary manner on one end to a fixed point member, and on a second end to a member movable in relation to the fixed point member, said variable point position determining arrangement comprising:

(a) a housing having a stationary portion secured to the fixed point member and an extendable portion secured to the movable member;

(b) a bracket member secured between said extendable portion of said housing and the movable member;

(c) tracking means having at least a portion formed of an elastic material connected on one end to said bracket member and on a second end to the fixed point member for following movement of the movable member in at least one plane;

(d) adjusting means connected between said tracking means and the fixed point member for adjusting a tension value of said elastic portion of said tracking means;

(e) following means having a rod portion connectable to said elastic portion for following said tracking means a proportionate distance in relation to movement of the movable member, said following means further outputting a distance signal as a function of such proportionate following movements; and

(f) evaluating means for receiving such distance signal and deriving a position value of the movable member in relation to the fixed point object therefrom.

4,566,197

SHOE CONSTRUCTION

Fred B. Sitzes, Cape Girardeau, Mo., assignor to Intereo Incorporated, St. Louis, Mo.

Filed Aug. 1, 1983, Ser. No. 519,339

Int. Cl.[4] A43B *3/14*

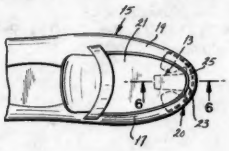
U.S. Cl. 36—011 **3 Claims**

1. A shoe of the moccasin type having a crush- and deformation-resistant toe, the shoe including a shoe upper, and a sole part, and characterized by a premolded box toe stiffener for stiffening the toe region of the upper, the stiffener being of heat-formable material and flexible but resiliently stable character, the stiffener comprising an upstanding flange of curved configuration for lying against and providing securement to

the corresponding interior surface of the upper within the toe region thereof, a principal tab extending rearwardly from the bottom edge of the flange for securement to the sole part, the flange having a front, outer surface coated with a heat-activated adhesive for adhesive securement to said interior surface, the flange having a rear, inner surface and directed toward the interior of the shoe;

(i) said box toe stiffener including side tabs extending rearwardly from the bottom edge of the flange at opposite sides of the principal tab for securement also to the sole part;

(ii) said box toe stiffener being formed from a flat blank of resilient formable sheet material, the blank having a substantially rectilinear forward edge, a forward portion of



substantial width for defining and forming said flange, a central rearwardly extending portion of reduced width for defining and forming said principal tab;

(iii) said flat blank having ear-like enlarged regions at opposite sides of the forward portion extending rearwardly for part of the rearward length of the rearwardly extending portion for defining and forming the side tabs, the principal tab being centrally located between the side tabs, and

(iv) said side tabs being directed toward the principal tab in converging relation, but separated therefrom by rearwardly opening narrow recesses, the side and principal tabs being coplanar, the box toe stiffener including regions of reduced material thickness at opposite side edges of the flange.

4,566,198

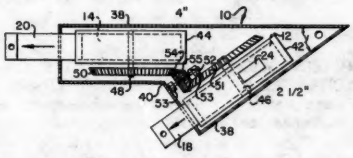
TAPE SQUARE

Ralph A. Vitale, P.O. Box 15736, Sarasota, Fla. 33579

Filed Aug. 9, 1984, Ser. No. 639,677

Int. Cl.[4] G01B *3/10*

U.S. Cl. 33—138 **19 Claims**



1. A squaring device, comprising:

a support;

two reels of tape, said reels each being rotatable about a separate axis and mounted on said support with the axes of the two reels inclined to each other to enable a tape to unreel from each reel with an acute angle between the two tapes; and

gearing operatively connected between the two tapes to effect simultaneous unreeling thereof, whereby the two tapes unreel in a predetermined ratio to each other,

wherein said gearing has a gear ratio which is a function of said acute angle.

4,566,199

SLIDING CALIPER

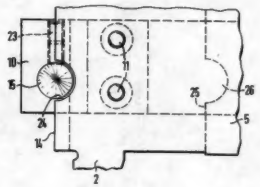
Siegfried Gruhler, Vohringen, and Michael Wolf, Oberndorf, both of Fed. Rep. of Germany, assignors to Societe Anonyme des Ets. Pierre Roch, France

Filed Nov. 16, 1984, Ser. No. 672,370

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341450

Int. Cl.[4] G01B *3/38*

U.S. Cl. 33—143 M **5 Claims**



1. A sliding caliper for measuring an article, comprising a scale having a front end measuring edge adapted to be positioned on the article to be measured, a slide movable over said scale and having an opening defining a readout display of said scale, and a measuring tip depending from said scale and having an axis of symmetry passing through the measuring edge, a holder carried by said scale having a bore in an axis of symmetry passing through the measuring edge of said measuring tip being engaged in said bore and protruding through a semicircular opening of said scale edge, said tip having a radius which starts at the measuring edge and is at least equal to the radius of the cylindrical part of the measuring tip which is coincident with a semicircular opening on the measuring edge of the slide.

4,566,200

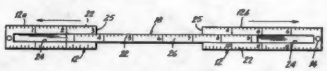
LONG RULERS

Leon Brady, and George Spector, both of 233 Broadway Rm 3615, New York, N.Y. 10007

Filed Nov. 16, 1984, Ser. No. 671,996

Int. Cl.[4] G01B *3/08*

U.S. Cl. 33—161 **4 Claims**



1. A folding extension ruler which comprises:

(a) a plurality of arms, each said arm having a hinge and a joint at each end so that said arms can be foldably attached together;

(b) means for extending each said arm to twice its length from middle of said arm;

(c) means for locking each said arm in its fully extended position; and

(d) appropriate measuring indicia located on each said arm and said extending means, wherein said means for extending each said arm to twice its length from middle of said arm comprises:

(a) said arm having a longitudinal slot therein said arm split vertically down the middle thus forming two halves; and

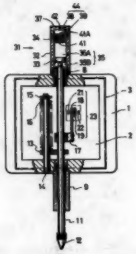
(b) an extension slide to engage said slot in each said half of said arm so that said arm can extend to twice its length from middle of said arm.

4,566,201

DIGITAL INDICATING TYPE DIMENSION MEASURING INSTRUMENT

Munenori Ishii, Tochigi, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,859
Claims priority, application Japan, Mar. 16, 1983, 58-44652
Int. Cl.[4] G01B 3/22, 7/02
U.S. Cl. 33—172 E 8 Claims



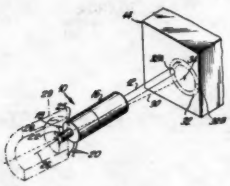
1. In a digital indication type dimension measuring instrument, wherein a spindle having a measuring element is resiliently biased in one direction on the axial line thereof, said spindle is provided with a dashpot type shock absorbing mechanism using air as a pressure fluid, means is provided for converting a displacement value of said spindle into an electric signal and digitally indicating same, the improvement comprising wherein said shock absorbing mechanism is provided with pressure adjusting means for exhausting said pressure fluid to the atmosphere in accordance with the inclination of said spindle to adjust the pressure of said pressure fluid.

4,566,202

LASER APPARATUS FOR EFFECTIVELY PROJECTING THE AXIS OF ROTATION OF A ROTATING TOOL HOLDER

Martin R. Hamar, 118 Old Ridgefield Rd., Wilton, Conn. 06897

Filed Dec. 6, 1983, Ser. No. 558,624
Int. Cl.[4] G01C 1/00
U.S. Cl. 33—286 16 Claims



1. A laser apparatus for effectively projecting the axis of rotation of a rotating tool or work piece holder onto an object spaced therefrom, said apparatus comprising;

a housing having first and second opposed ends;

a generally elongated mounting stud fixedly connected to and extending from the first end of said housing, said mounting stud being of a size and shape to be held by the rotating tool or work piece holder such that the longitudinal axis of the mounting stud is approximately aligned with the axis of rotation of the rotating tool or work piece holder;

a lasing element mounted in said housing and disposed to project a laser beam out of the second end of said of housing and substantially collinear with the longitudinal axis of the mounting stud; and

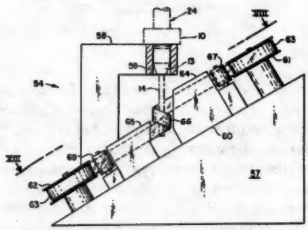
a target disposed on said object, said target including photocell means responsive to the laser beam to produce electrical output signals capable of identifying locations of the points at which the target is impinged by the laser beam projected by the lasing element whereby when the mounting stud is held by the rotating tool or work piece holder, the laser beam projected by the lasing element will trace an annulus on the target disposed on the object, with the center of the annulus defining a point on a projection of the axis of rotation of the rotating tool or work piece holder.

4,566,203

APPARATUS AND METHOD USEFUL FOR REMOVING LIQUID FROM THE OUTER SURFACE OF CYLINDRICAL PIPETTE TUBE OR THE LIKE

Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 306,206, Sep. 28, 1981, Pat. No. 4,488,814.
This application Aug. 6, 1984, Ser. No. 637,965
Int. Cl.[4] F26B 5/16
U.S. Cl. 34—9 18 Claims



1. Apparatus useful for removing liquid from the outer surface of a cylindrical tube or the like comprising means for supporting at least one extent of dry bibulous material with first portions thereof in standby positions at a work station wherein said portions are sufficiently spaced apart to permit ready interposition of a cylindrical tube in an operative position therebetween spaced from each of said first portions; actuating means for moving said first portions from said standby positions into contact with outer surface portions of a cylindrical tube in said operative position and for thereafter retracting said first portions from contact with such tube to said standby positions; and means for substituting for the retracted first portions of bibulous material replacement second portions of dry bibulous material in said standby positions.

4,566,204

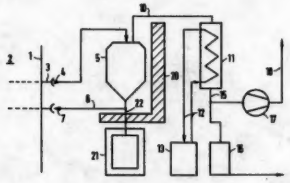
TREATING WEAK-TO MEDIUM-ACTIVE ION EXCHANGER RESINS IN A DRYING VESSEL

Karl Friesner, Bamberg; Dietmar Bege, Erlangen; Dietmar Erbse, Rodenbach, and Siegfried Meininger, Altenstadt, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,933
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335394
Int. Cl.[4] F26B 3/20, 5/04
U.S. Cl. 34—15 7 Claims

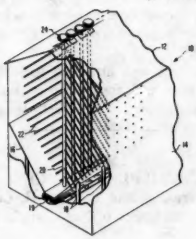
1. Method for treating weak-to medium-radioactive ion exchanger resins in a drying container by means of heat and in a vacuum which comprises, passing wet radioactive ion exchanger resin into a drying container enclosing an insert made of metal with good heat conduction, having a cylindrical jacket, a screen bottom, and radial ribs extending inwardly from the jacket into the bulk of the resin leaving a core of at most 100 mm thickness, and dividing the cylindrical volume of the insert which receives the wet resins to be dried into sectors

each of small volume relative to the volume of the drying chamber to provide a large metal heating surface of the insert in contact with the resin in the drying chamber and to subdivide the resin in the drying chamber into small volumes of sector shape with each small sector shaped volume of resin in direct heat transfer contact on three sides with the metal heating surface of the insert, introducing heat by heat conduction



via the metallic heat transfer surfaces into the resin while maintaining the drying chamber under a pressure of 300 mbar or less to effect vaporization of water in the wet resin unitl the resin is dried to a residual moisture of at most 5% by weight, and discharging water vapor from the drying container through a discharge line into a condenser maintained at a pressure of 300 mbar or less to effect condensation of the water vapor.

4,566,205
GRAIN DRYING AND STORAGE STRUCTURE
Lester Schlagel, P.O. Box 8157, Loveland, Colo. 80539
Filed Jan. 30, 1984, Ser. No. 574,866
Int. Cl.[4] E04H *7/24*; F26B *19/00*
U.S. Cl. 34—232 **27 Claims**



1. A grain storage structure which is adapted to dry grain stored therein, said storage structure comprising:
(a) a floor portion;
(b) a roof portion;
(c) upright wall portions disposed between said floor and roof portions; wherein said wall portions have a plurality of openings therein;
(d) at least one vertical tubular stack extending between said floor and said roof portions and further having an open end which extends through said roof portions;
(e) a plurality of elongated perforated tubes disposed between said stack and said wall portions; said tubes having interior ends and exterior ends, wherein said tubes extend upwardly from said exterior ends to said interior ends at an inclined angle of at least about 60°, wherein the interior ends of said tubes communicate with said stack and the exterior ends communicate with said openings in said wall portions; wherein said tubes are perforated except on the underside thereof in a manner such that said tubes are adapted to direct condensed moisture through said openings in said wall portions; and wherein the spacing between adjacent tubes is not greater than about 18 inches; and wherein said storage structure is adapted to permit air to pass upwardly through said perforated tubes into said stack and then through said stack and out of said structure.

4,566,206
SHOE HEEL SPRING SUPPORT
Milton N. Weber, 20655 Audette, Dearborn, Mich. 48124
Filed Apr. 16, 1984, Ser. No. 600,886
Int. Cl.[4] A43B *3/10*
U.S. Cl. 36—7.8 **8 Claims**

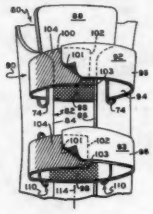
1. A springy heel shoe comprising:
a shoe formed for receiving a wearer's foot and having a bottom which is generally formed as a forward sole portion and a rearward heel portion;
an undamped, compression spring means provided at the heel portion for resiliently compressing under the pressure of the rear, heel portion of the wearer's foot directed towards the ground support, and for resiliently expanding upon release of such pressure for returning a substantial portion of the energy of such pressure;
said spring means being formed of an integral V-shape, made of a stiff, springy material, providing an upper leaf-like leg and a lower, leaf-like leg integrally joined together at a forwardly directed acute angle apex with the free ends of the legs located at, and being beneath, the rear of the shoe;
and a leaf-like intermediate leg located within the V-shape, between and integrally joined with one, and extending towards the other, of the upper and lower legs, and having a free end portion which is normally spaced from, but under sufficient pressure moves towards and bottoms out against a portion of the leg with which it is not joined;
wherein the free end portions of the upper and lower legs resiliently compress together under wearer foot pressure at a predetermined, generally uniform spring rate, until the intermediate leg bottoms out and thereafter, under further pressure, the spring means continues compressing at a predetermined increased spring rate which is considerably more resistant to compression.

4,566,207
SPORTS SHOE
Bernard J. Struntz, 1002 Woodbridge St., St. Paul, Minn. 55117
Filed Aug. 4, 1983, Ser. No. 520,415
Int. Cl.[4] A43B *11/00*; A43C *5/00, 9/00*
U.S. Cl. 36—50 **2 Claims**

1. A shoe having an opening to facilitate entry of the foot, lace receiving means on opposite sides of the opening, said lace receiving means comprising at least one pair of eyelets, each eyelet of each such pair being located opposite the other on opposite sides of the opening for the foot, at least one single length of strap material, each length pass-

ing through one pair of eyelets and folded so as to be closed in a loop upon itself when in use and being removable from the shoe and replaceable in the nature of a shoelace,

said strap having end portions with opposite surfaces of said end portions being placed in overlapping mating relationship and defining mating surfaces on each end of the strap composed of cloth areas of different compositions on opposite surfaces comprising hooks on one mating cloth



surface and loops on the other mating cloth surface adapted to stick together when placed in contact with each other,

the opposite ends of said strap being thereby secured to each other to hold the shoe tightly on the foot whereby the opening in the shoe is held together solely by the bond between the ends of the strap and

each said strap being otherwise unconnected to the shoe whereby it can be withdrawn from the eyelets when the ends thereof are freed from one another.

4,566,208

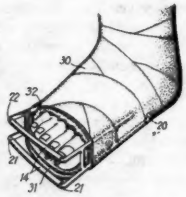
TOE PROTECTOR

Richard L. Shaffner, 1640 Damon Ct., Atlanta, Ga. 30338

Filed May 24, 1984, Ser. No. 613,273

Int. Cl.[4] A43B *7/00*

U.S. Cl. 36—110 **11 Claims**



1. A toe protector comprising, in combination, two elongated guard rails adapted for positioning adjacent opposite sides of a human foot, at least one elongated front rail adapted for positioning in front of the toes of the human foot, and means for releasibly coupling opposite ends of said front rail with end portions of said two guard rails so as to form a generally U-shaped toe protector having guard rails that are mountable to the sides of a foot covering and a front rail that is releasibly mountable to the two guard rails while the guard rails remain mounted to the foot covering.

4,566,209

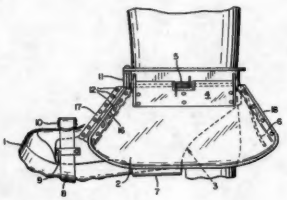
BOOT WITH EXPANDING WEBS

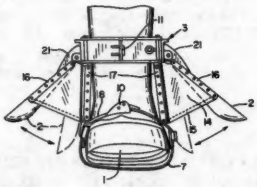
James R. Johnson, 4361 Ivory Way, NE., Salem, Oreg. 97305

Filed Jul. 5, 1984, Ser. No. 627,914

Int. Cl.[4] A43B *5/00*

U.S. Cl. 36—116 **4 Claims**





1. In a boot or boot add-on the improvement comprising:

a. a front expanding web attached to a foot support by means of a front web-foot support mounting plate and attached to a wing by means of a front web-wing mounting plate where said foot support is pivotably attached to said wing; and

b. a rear expanding web attached to said foot support by means of a rear web-foot support mounting plate and attached to said wing by rear web-wing mounting plate.

4,566,210

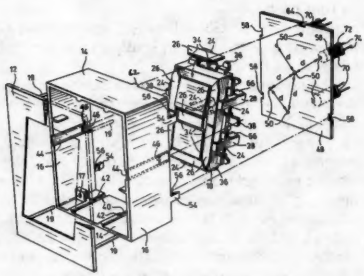
DISPLAY DEVICE

Donald Winrow, Weston, and Kenneth G. Copeland, Oakville, both of Canada, assignors to Nei Canada Limited, Toronto, Canada

Filed Jun. 13, 1983, Ser. No. 503,515

Int. Cl.[4] G09F *9/00*

U.S. Cl. 40—449 **3 Claims**



1. A display device comprising:

a housing comprising a front wall facing a viewing direction, a side wall assembly extending rearwardly therefrom, an opening in the front wall of said housing,

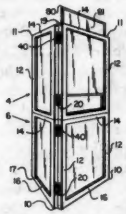
a plurality of pivotal elements pivotally mounted in said housing,
each element comprising:
a lever arm extending generally forwardly and rearwardly from said pivot point,
a relatively thin member mounted adjacent the forward end of the lever with its thin dimension approximately radially oriented relative to the pivotal axis, and attached adjacent one edge thereof to the lever,
means mounted on said pivotal element holding a magnet on the opposite side of said pivot point from said thin member,
said pivotal elements being mounted in said housing to mvoe between two limiting positions, one limiting position corresponding to the display of said thin member in said aperture and there being, when said pivotally mounted element is in said other limiting position, means associated with said housing for eclipsing said thin element, in the viewing direction,
said thin member being coloured to contrast with the background of the opening when viewed in said viewing direction,
said magnet being magnetized to define a magnetic axis roughly perpendicular to the radius from said pivot axis and in a plane having a component perpendicular to said pivot axis,
a rear wall for said housing releasably attached to said side walls by a resilient deflectable connection located to be spaced rearwardly from but adjacent to the locus of magnet movement,
an aperture in said rear wall corresponding to each magnet,
a reversible permanently magnetizable core mounted in a corresponding aperture in said rear wall,
the forward end of each said core being adjacent to and a predetermined distance from the forward surface of said rear wall,
said core extending rearwardly from said rear wall,
an energizing coil mounted on each said core,
means for fixedly locating said rear wall relative to said side wall assembly and said magnets,
each said core when so located in the corresponding aperture being designed when polarized in one sense to exert a force on the corresponding permanent magnet over its entire range of movement between limiting positions, and when polarized in the other sense to exert a force in the opposite sense on the corresponding permanent magnet over its entire range of movement between limiting positions.

4,566,211

MODULAR DISPLAY UNIT

John A. Gustafson, Barrington, and D. Richard Dahlstrom, Chicago, both of Ill., assignors to Dahlstrom Display, Inc., Chicago, Ill.

Filed Oct. 25, 1984, Ser. No. 664,543
Int. Cl.[4] G09F 7/00
U.S. Cl. 40—605 **8 Claims**



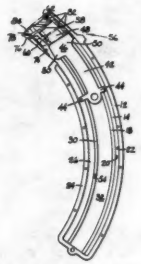
1. For use in a knock down-type modular display apparatus embodying quadrangular display frames adapted to receive display panels wherein the frames are hingedly interconnected side-to-side allowing them to be incrementally folded about a vertical axis, the combination comprising: one or more flexible unitary hinge connectors and two or more adjacent quadrangular frames having side rails, each such side rail having an outer peripheral face formed with one or more openings into which the hinge-connectors may be inserted and detachably interlocked therewith; the connectors each comprising a flexible elongated central portion operatively extending between adjacent frames from one of said openings in the outer peripheral face of a first frame side rail, across a connective region between the frames and into an opposing one of said openings in the outer peripheral face of a second frame side rail; the flexible central portion of each connector having enlarged terminal ends defining connector locking members; each of said openings in each frame side rail comprising a keyhole slot receptive of a said connector locking member therein via a widened opening portion thereof and operable to removably lock said locking member behind a narrowed opening portion thereof; the keyhole slots being of substantially less lengthwise extent than the length of a said frame side rail and located intermediate the ends thereof.

4,566,212

CARTRIDGE CLIP

M. Gaines Chesnut, 17219 W. 57th Pl., Golden, Colo. 80401

Filed Oct. 24, 1983, Ser. No. 544,683
Int. Cl.[4] F41C 25/02
U.S. Cl. 42—50 **8 Claims**



1. A firearm cartridge clip for housing a number of cartridges, each of the cartridges having a rim, comprising:
a case for storing cartridges, said case including a top portion, first and second side walls, and first and second end walls joining said first and second side walls together to define a cavity, each of said first and second side walls having a width greater than the width of each of said first and second end walls, each of said first and second end walls having an outer surface and an inner surface;
first inner projections extending from each of said first and second side walls to provide surfaces spaced from and facing portions of said inner surface of said first end wall so as to form opposed grooves in said first and second side walls;
an opening formed adjacent to said top portion of said case through which the cartridges may be moved;
said inner surface of said first end wall extending in an arcuate direction substantially throughout the entire extent of said first end wall;
said second end wall including a discontinuity, said discontinuity being in the form of an aperture located substantially between first and second portions of said second end wall, said first portion extending in a first plane from said opening in said case top portion to said discontinuity, said discontinuity being parallel to said first plane and providing communication between said cavity and the exterior of the clip;

said inner surface of said second end wall second portion extending in an arcuate direction;

a portion of said outer surface of said first end wall extending away from said opening in a substantially linear direction;

a portion of said outer surface of said second end wall extending away from said opening in a substantially linear direction;

a follower mounted for sliding movement in said case and adapted to contact a lowermost cartridge in said case; and

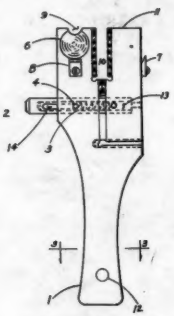
spring means for providing a force resisting movement of said follower into the case and for urging said follower in a direction out of said case as the cartridges are loaded into or moved out of said case.

4,566,213

FISH LINE KNOT TYING JIG

George E. Cossin, 627 E. Oleander Cir., Barefoot Bay, Fla. 32958

Filed May 4, 1984, Ser. No. 607,215
Int. Cl.[4] A01K *91/04*
U.S. Cl. 43—1 2 Claims



1. A line Knot Tying Jig comprising, a body having a fixed jaw at one end and a handle at the other end; a laterally movable jaw parallel to said fixed jaw, and in co-operation therewith for holding fishing gear for use in affixing a resilient line thereto; a hollow plunger rod secured to said movable jaw and slidably guided within said body; spring means in said plunger rod operatively biasing said movable jaw toward the fixed jaw to hold said fishing gear; an anchor post mounted on said fixed jaw and extending perpendicularly thereto, said anchor post having a relief groove in one side, whereby a line can be secured to the fishing gear held between the jaws and a knot tied by wrapping the line in relation to the anchor post and relief groove.

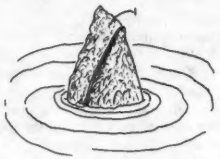
4,566,214

FEEDING WILDFOWL DECOY

Michael L. McCrory, 279 Southwick, Southaven, Miss. 38671, and Roy E. McCrory, 4044 Bishops Bridge Rd., Memphis, Tenn. 38118

Filed Feb. 27, 1984, Ser. No. 583,649
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 9 Claims

1. An electromechanical wildfowl decoy comprising a floatable hollow body being formed in the image of a wildfowl and housing therein means for establishing an eccentric rotatable center of gravity, for the purpose of imparting life-like motion to said decoy, said means for establishing an eccentric rotatable center of gravity comprising an electric motor and shaft located at substantially the horizontal center of said hollow body, weight means and coupling means for coupling said



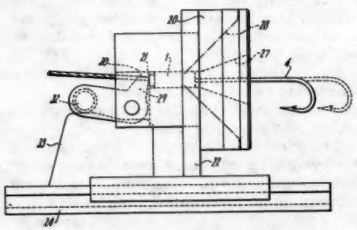
weight means to said shaft for eccentric rotational motion about said horizontal center.

4,566,215

APPARATUS FOR THE RELEASE OF A FISH HOOK FROM A SNOOD HEAD

Kolbjörn Björshol, N-6560, Langöyneset, Norway

PCT No. PCT/No83/00030, § 371 Date Mar. 27, 1984, § 102(e) Date Mar. 27, 1984, PCT Pub. No. WO84/00469, PCT Pub. Date Feb. 16, 1984
PCT Filed Aug. 1, 1983, Ser. No. 598,328
Claims priority, application Norway, Aug. 3, 1982, 822650
Int. Cl.[4] A01K *83/00, 91/04*
U.S. Cl. 43—4 3 Claims

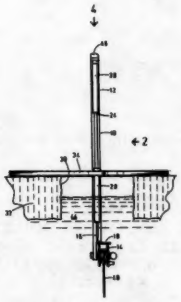


1. An apparatus for the release of a fish hook from an elongated snood head of the type which has a transversely-extending opening and which includes a substantially U-shaped leaf spring that is movable in the opening in the longitudinal direction of the snood head, the substantially U-shaped spring having branches which are adapted to cooperate with an annular face on the leg of a fish hood and, in part, to be spread apart when each cooperates with an oblique surface in the transversely-extending opening for the purpose of releasing the engagement between the hook leg and the leaf spring; the apparatus comprising a movable housing having a longitudinal cavity that has a cross section that corresponds to the cross section of said snood head and a conical entry portion, a plurality of wire springs which extend obliquely towards said cavity, said wire springs having inner ends which extend into said cavity and through the transversely-extending opening in said snood head and capable of abutting said substantially U-shaped leaf spring, a cock which is pivotally mounted to said housing, said cock having a point portion which extends into said cavity and a caster, and a stationary cam along which said caster of said cock moves when said housing is moved in parallel with the longitudinal cavity therein, the pivotal movement of said cock due to its caster moving over said cam causing said snood head to move relative to said substantially U-shaped leaf spring to spread each of its branches along the oblique surface in said opening to release the engagement between said hook leg and said leaf spring.

4,566,216
ICE FISHING RIG

Thomas G. Randall, P.O. Box 3810, East Livermore, Me. 04228

Filed Nov. 8, 1984, Ser. No. 669,639
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 6 Claims

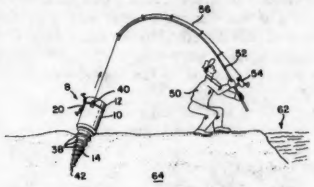


1. An ice fishing rig comprising
an elongated, hollow waterproof tube
a fishing line reel rotatably mounted at one end of such tube
means for holding said tube in fishing position suspended vertically through a hole in the ice with its reel submerged
a rod pivotally held within said tube with its lower end projecting therefrom at a location adjacent said reel
coacting means on said reel and the projecting portion of said rod for pivoting said rod when said reel is rotated
at least the upper end portion of said tube being transparent
a distinctive signal mounted in the upper end of said tube and visible therethrough
an opaque shield slidably held in the upper portion of said tube
said shield in its upper position surrounding and hiding said signal from view and in its lower position exposing said signal to view, and
retractable means on said rod operable by pivotal motion of said rod and adapted when extended to retain said shield in its upper position and to release the same when retracted so that said shield can drop by gravity within said tube to reveal said signal.

4,566,217
BAIT CASTING DEVICE AND METHOD

Nelse Geary, Sr., 18 Cannon Dr., Trenton, N.J. 08690

Filed Apr. 6, 1982, Ser. No. 366,044
The portion of the term of this patent subsequent to May 28, 2001, has been disclaimed.
Int. Cl.[4] A01K *91/02*
U.S. Cl. 43—19 10 Claims

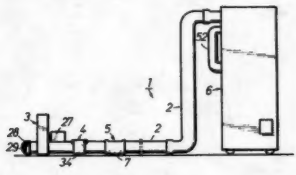


1. A casting device comprising an enclosure having an aperture and a coverable opening, attachment means connected to said enclosure for attaching said enclosure to earth, cover means for covering said opening connected to said enclosure, means for demountably attaching said cover means to said enclosure whereby said cover means is demounted by the application of a remote force conveyed through said aperture during casting and applied to said cover means from within said enclosure.

4,566,218
APPARATUS FOR AUTOMATICALLY TRAPPING AND PROCESSING RATS OR THE LIKE

Toshishige Kurosawa, Tokyo; Satoru Ishisaka, Yokohama; Kazuki Yasutomi, and Takanobu Ishiwatari, both of Kawasaki, all of Japan, assignors to Ikari Corporation, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,305
Int. Cl.[4] A01M *23/08*
U.S. Cl. 43—58 8 Claims



1. An apparatus for automatically trapping and processing rats or the like, comprising:
(a) a tube defining a passage and a delivery path and having an entry opening for rats or the like;
(b) first means mounted on an end of said tube for supplying a spherical carrier into said tube when a rat or the like is to be delivered through said delivery path;
(c) second means mounted in said entry opening for closing the same when the rat or the like has entered into said passage in the tube;
(d) third means mounted on said tube for detecting the entry of the rat or the like into said tube; and
(e) fourth means connected to an opposite end of said tube for generating a vacuum air flow in said tube for delivering the rat or the like and the carrier into a bag-shaped film and closing the bag-shaped film.

4,566,219
GARDEN PEST BARRIER

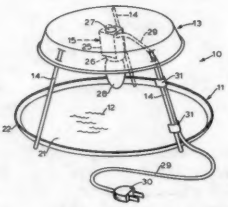
Milton D. Firth, P.O. Box 464, Dutch Harbor, Ak. 99692

Filed Jun. 25, 1984, Ser. No. 624,207
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—107 6 Claims

1. A garden pest barrier comprising,
a wall structure of elongate shape adapted for rested edgewise placement along a ground surface adjacent a garden,

means retaining the wall structure in place said wall structure includes a water shield disposed substantially normal to the remaining wall structure and having a lengthwise oriented concave upper surface to serve as a gutter, and pesticide retention means including upper and lower horizontal flanges disposed lengthwise along said wall structure and integral therewith, said flanges being spaced from one another and thereby adapted to frictionally receive and retain a pesticide body inserted therebetween.

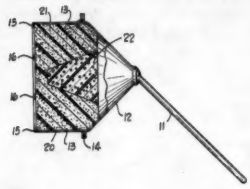
4,566,220
INSECT TRAP
Steve Justice, Parkton, N.C., assignor to Clarence Orville Williams, Rocky Mount, N.C.
Filed Aug. 29, 1984, Ser. No. 645,415
Int. Cl.[4] A01M *1/04*
U.S. Cl. 43—113 **6 Claims**



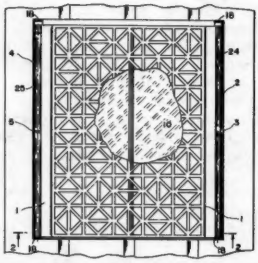
1. A trap for catching wingless non-flying fleas, comprising:
(a) a shallow pan having and supported by a flat bottom wall enabling said pan to be accessible to a source of fleas to be trapped;
(b) a sticky substance disposed in said pan and providing a sticky landing surface above said bottom wall for live fleas to be trapped and killed;
(c) a cover supported in vertically spaced relation over said pan, having a light reflective surface opposing the said bottom wall of said pan and located to provide open unobstructed space between said cover and pan to permit said fleas to jump through said space into said pan to contact said sticky landing surface; and
(d) an electrically energized visible green light source, said green light source being secured to said cover below said light reflective surface thereby generating and exposing to the fleas sought to be trapped both reflected downwardly transmitted green light mixed with downwardly and outwardly transmitted directly radiated green light from said source.

4,566,221
FLOWER SUPPORT FOR WEDDING BOUQUETS AND THE LIKE
Jacqualine Kossin, 9805 Columbia Rd., Olmsted Falls, Ohio 44138
Filed Aug. 3, 1984, Ser. No. 637,493
Int. Cl.[4] A01G *5/00*
U.S. Cl. 47—41.12 **3 Claims**

1. A flower holder in combination with live cut flowers comprising:
a moisture retentive block of hydrophilic water absorbent synthetic resin foam, a supportive core of expanded, synthetic resin foam inside of said block, said core being shaped and located in position so that it is penetrated by floral picks on the ends of flower stems inserted into said block, and said core being non-friable and stronger than said block, whereby live cut flowers are held securely in said holder by penetration of the floral picks into said core, with the cut ends of the stems terminating within said block short of said core and are kept fresh by maintaining the cut ends of the flower stems exposed to moisture in said block.



4,566,222
ONE PIECE WINDOW OR DOOR GUARD
Charles C. Hatvany, 526 La Tierra Dr., Angwin, Calif. 94508
Filed Feb. 6, 1984, Ser. No. 577,595
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—56 **21 Claims**



1. A guard for an opening in a wall or the like comprising: a generally planar guard element;
pivotal mounting means along one edge of said guard element for mounting said guard element upon said wall to cover the exterior of said opening when said guard element is in a substantially coplanar orientation to said wall;
said pivotal mounting means allowing said guard element to be pivotally moved away from said wall and out of a substantially coplanar orientation to said wall;
said pivotal mounting means allowing said guard element to be repetitively removed from attachment to said wall and to be repetitively remounted upon said wall, both without a tool or a key;
said pivotal mounting means being inaccessible and blocked from sight from the exterior of said guard element;
fastening means for securing said guard element to said wall, preventing either the removal or opening of said guard element and access to the interior of said opening;
said fastening means comprising:
a tubular member carried on the opposite edge of said guard element;
at least one slot in said tubular member;
at least one locking bolt carried on said wall to extend through said slot;
a head on said locking bolt;
said bolt being rotatable about its own axis between a locking position wherein said head may not be disengaged from said slot, and an opening position wherein said head will pass radially through said slot; and
opening means for unlocking and allowing the pivotal opening of said guard element to allow egress from the interior of said opening;

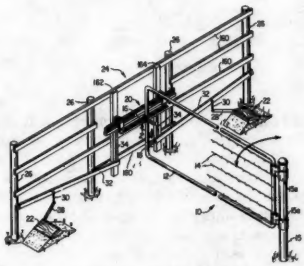
said opening means not being capable of activation from the exterior of said guard element,
said opening means comprising:
operating means accessible from the interior of said guard member and wall for rotating said lock bolt through about 90° between said locking and opening positions;
said unlocking and opening not requiring a tool or key or exceptional strength.

4,566,223

PEDAL ACTUATED GATE

Felix B. Romberg, P.O. Box 218, Holland, Tex. 76534

Filed May 7, 1984, Ser. No. 607,772
Int. Cl.⁴ E05F *13/00*
U.S. Cl. 49—264 **5 Claims**



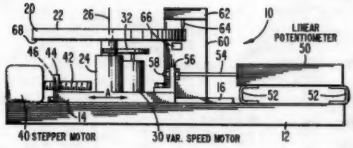
1. A pedal actuated gate comprising:
a gate mounted to pivot laterally between a normal closed position and open positions in two opposite directions from said closed position, said gate having an openable end;
an assembly mounted adjacent the openable end of the gate at its closed position;
said assembly having means for applying thrust in two lateral directions against said openable end of said gate to fling the gate to open positions in said two directions;
first and second pedal mechanisms engageable by a vehicle wheel, located one on each side of said gate and so connected with said means for applying thrust laterally to said gate that vehicle wheel engagement with a pedal mechanism actuates said assembly to fling the gate open in the direction away from said engaged pedal mechanism;
a pedal mounted on an elevated base and spanning an opening defined by said base;
said pedal being hinged at a hinge line near one side of said opening and having an arm extending beyond the distal end of said pedal from said hinge line;
said base having narrow edges along the side of said opening near said hinge line and along the thereto distal side of said opening for the pedal to rest on when depressed by wheel weight;
said pedal comprising extensions for resting on and extending beyond said edges;
said base sloping downward away from under said extensions of said pedal;
a lever pivotally mounted above said arm;
means connecting said arm and said lever; and
means connecting said lever with said means for applying lateral pressure to said gate for flinging it to an open position.

4,566,224

LAPPING APPARATUS

Anton G. Moldovan, E. Windsor Township, Mercer County, and Randall E. McCoy, Willingboro Township, Burlington County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1984, Ser. No. 664,219
Int. Cl.⁴ B24B *19/16*
U.S. Cl. 51—56 R **4 Claims**



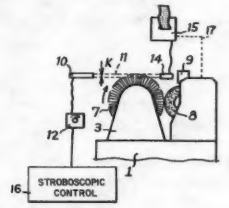
1. An improved lapping apparatus having:
(a) a disc shaped lap journaled for rotation about an axis, said disc shaped lap having a lapping surface perpendicular to said axis;
(b) means for rotating said disc shaped lap;
(c) holder means for positioning and holding a part to be lapped in contact with said lapping surface;
(d) means for effecting movement of one of said holder means and said disc shaped lap thereby causing said holder means to track a series of substantially continuous positions with respect to said axis so that said part while in contact with said lapping surface traverses a portion thereof in either a direction toward said axis or a direction away therefrom;
the improvement comprising control means for effecting control of said means for rotating said lap so that the relative linear speed of said lapping surface with respect to said part at the point of contact with said part is substantially constant while said part traverses said portion of said lapping surface.

4,566,225

PROCESS AND APPARATUS FOR THE PRECISION MEASUREMENT OF ROTOR BLADE-HEIGHT

Henri Bizot, Paris; Jean Dautremont, Vaux-le-Penil, and Alain Sylvian, Thibault des Vignes, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Apr. 18, 1984, Ser. No. 601,726
Claims priority, application France, Apr. 20, 1983, 83 06416
Int. Cl.⁴ B24B *49/12*
U.S. Cl. 51—165.72 **10 Claims**



5. Apparatus for determining the height of turbine rotor blades under operating conditions comprising:
(a) rotating means to rotate the turbine rotor at a velocity sufficient to centrifuge all of the blades such that they obtain their maximum radially outward position;
(b) laser beam generating means to direct a laser beam hav-

ing a finite beam height tangentially onto the rotating turbine rotor such that the tips of the blades extend at least partially into the beam;

(c) control means to stroboscopically control the laser beam generating means such that the laser beam illuminates only a single blade at a time;

(d) measuring means to measure the luminous intensity of the laser beam passing beyond the rotor blade; and,

(e) means to determine the height of the blade based upon the measured luminous intensity connected to the measuring means.

4,566,226

SYSTEM FOR CORRECTING THE POSITION OF A SPINDLE FOR A PROCESSING MACHINE

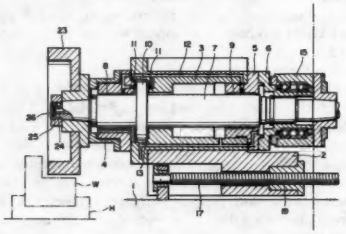
Sosaku Kimura, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,675

Claims priority, application Japan, Oct. 20, 1983, 58-195269

Int. Cl.⁴ B24B *49/12*

U.S. Cl. 51—165.72 **5 Claims**



1. a system for correcting the position for a processing machine having a bed and a holder operatively mounted on the bed, comprising:

a spindle rotatably mounted by bearings, and having an axial hole and an end portion;

first means for changing the relative position of said end portion and said holder;

a reflector provided in said hole at the end portion;

an interferometer provided adjacent the other end of said spindle opposite the reflector;

a laser unit for emitting a laser beam to said reflector and receiving the reflected laser beam through said interferometer and for producing a first output signal dependent on the position of said end potion;

comparing means for comparing said first output signal with a reference value and for producing a second output signal dependent on the difference between said first output signal and said reference value; and

second means responsive to said second output signal for operating said first means to correct the relative position.

4,566,227

AUXILIARY DEVICE FOR RE-GRINDING OF SPIRAL DRILLS

Robert Wolff, Im Kiesacker 12, 5446 Engeln, Fed. Rep. of Germany

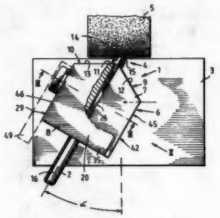
Filed Jun. 27, 1984, Ser. No. 625,236

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338910

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—219 R **8 Claims**

1. An auxiliary device for re-grinding a spiral drill by a stationary grinding disc mounted with a horizontally rotating axis and by a horizontal grinding table, the spiral drill having a center angle inclined with respect to cutting edges thereof, the auxaillary device comprising a polyhedronal shaped body means, a channel means provided in said body means for accommodating the spiral drill, a pair of clamping jaws, means for clamping the spiral drill in the body means, said pair of clamping jaw means being divided substantially along said channel means, means for enabling the clamping jaws to be displaced towards and away from each other to respectively effect a clamping and a release of the spiral drill, two sight-edges for visually orienting the cutting edges of the spiral drill parallel to a grinding surface said sight edges being formed at an outlet end of said channel means and including an angle equal to the center angle, a bottom surface of the body means forms a supporting surface for supporting the body means on a grinding table at a predetermined front clearance angle with respect to a longitudinal center axis of the drill, whereby said center axis is inclined upwardly with respect to the outlet end



of said channel means, a top surface forming a further supporting surface for supporting the body means in a position turned through 180° on the grinding table and inclined at a same but mirror inverted front clearance angle with respect to said center axis of the drill, one of said sight edges being on the top surface and the other sight edge being on the bottom surface of the body means, wherein for regrinding one of said cutting edges the body means is shifted with its bottom surface on the grinding table toward the grinding surface orthogonally to one of said sight edges, and wherein for regrinding the other cutting edge, the body means is turned upsidedown and shifted with the top surface lying on the grinding table towards the grinding surface orthogonally to the other one of said sight edges.

4,566,228

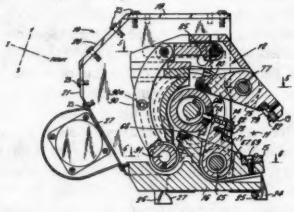
WORKPIECE GUIDES

Stanley G. Wheeler, Peterborough, United Kingdom, assignor to The Newall Engineering Company Limited, Peterborough, United Kingdom

Filed Feb. 22, 1984, Ser. No. 582,551

Int. Cl.⁴ B24B *41/06*

U.S. Cl. 51—238 S **22 Claims**



1. A workpiece guide for supporting a rotary workpiece comprising a base, three jaw members movably mounted on the base to embrace and support a workpiece for rotation about a central axis defined by the positions of the jaw members, drive means drivably connected to the three jaw members for moving the jaw members toward the central axis thereof for closing the jaw members to grip the workpiece and for moving

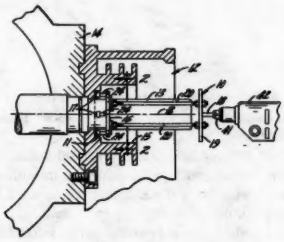
the jaw members away from the central axis to automatically release the jaw members by a predetermined amount to permit the workpiece to rotate therein while still supported coaxially with the axis by the jaw members irrespective of the workpiece diameter, and means for shifting as a unit the drive means and the jaw members drivably connected thereto relative to the base and transversely relative to the central axis, to adjust the central axis to coincide with an axis of a machine tool on which the guide is to be used whereby a workpiece supported by the guide has the axis thereof coincident with the machine tool axis whatever the workpiece diameter.

4,566,229

HONING TOOL

James D. Lillie, 4657 Straw La., Roscoe, Ill. 61073, and Rodney D. Skibbe, 20381 Manton Rd., Sterling, Ill. 61081

Filed Jul. 12, 1984, Ser. No. 629,991
Int. Cl.⁴ B24B *15/03*
U.S. Cl. 51—241 VS **6 Claims**



1. A tool for honing an annular work surface surrounding an axially projecting member, said tool having, in combination, a flat annulus adapted to encircle said member and having a forward side opposing said surface, a plurality of honing stone holders mounted on the forward side of said annulus and angularly spaced around the latter, a plurality of honing stones, one for each of said holders and each mounted in the associated holder and facing axially away from said annulus, a plate parallel to said annulus and spaced behind the other side of the latter, a plurality of elongated rods extending between and fixed to said plate and said annulus and rigidly connecting the plate to the annulus, said rods being angularly spaced around the longitudinal axis of said annulus thereby to permit said axially projecting member to project through said annulus and toward said plate when said honing stones engage said work surface, and a drive shaft rigid with and extending rearwardly from said plate, said shaft being axially alined with the axis of said annulus and adapted to be connected to a power actuator to turn said plate and said annulus bodily therewith and revolve said stones about said axis and around said work surface.

4,566,230

IMPACT BLASTING SYSTEM FOR ETCHING METAL SURFACES

James H. Carpenter, Jr., Hagerstown, Md., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation of Ser. No. 354,916, Mar. 4, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,483
Int. Cl.⁴ B24C *3/14*
U.S. Cl. 51—420 **21 Claims**

1. Apparatus for etching the surface of a metal workpiece for lithographic purposes, comprising:

a treating chamber;

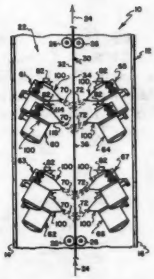
positioning means for positioning a workpiece within the treating chamber;

a centrifugal throwing wheel for receiving and projecting fine-grained, lightweight impact blasting media along a path of discharge onto the surface of a workpiece positioned within the treating chamber, the path of discharge being elongate in cross-section and extending along a first plane; and

shroud means connected to the centrifugal throwing wheel and extending about the discharge path for ducting the impact blasting media from the centrifugal throwing wheel toward the workpiece, the shroud means including:

first and second side walls extending in overlying but non-parallel relationship along opposite sides of the discharge path;

first and second end walls interconnecting the first and second side walls and cooperating therewith to define a closed-wall duct which is open at one end to receive the impact blasting media from the centrifugal throwing wheel, and which defines an elongate discharge opening at the other end thereof for discharging the impact blasting media toward the workpiece;



the first and second side walls being inclined relative to each other in a converging relationship for funneling and dampening the flow of blasting media as it moves along the discharge path between the first and second side walls to narrow the width of flow of the media in one dimension as the media travels through the duct;

the first and second side walls having opposed portions which are disposed on opposite sides of the first plane and which extend in spaced, parallel relationship to each other and to the first plane so as to define opposite sides of the discharge opening, the opposite sides of the discharge opening extending in a second plane substantially perpendicular to the first plane; and

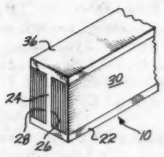
the discharge opening being spaced from the surface of the workpiece a distance close enough so that the surface is etched, but great enough that non-uniform etching is avoided.

4,566,231

VIBRATION DAMPING STIFFENER

Francis X. Konsevich, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1983, Ser. No. 536,555
Int. Cl.⁴ E04B *1/98*
U.S. Cl. 52—145 **16 Claims**



1. In combination:

a member which in use is caused to vibrate and which has a

structural makeup resulting in it wanting to vibrate at a relatively low frequency with a relatively large displacement;

a stiffening beam secured to a surface of said member, to span across the member and stiffen the member and increase its frequency of vibration while at the same time decreasing the displacement of vibration, said beam having at least one side surface extending generally perpendicular to the surface of the member; and

a plurality of layers of sheet damping material secured to each other and to said side surface of the stiffening beam by an adhesive material, said layers being attached to said side surface of said beam in a manner so that they are positioned generally perpendicular to the surface of the member, for damping vibration of the member by absorbing member vibrational energy which is transmitted to said stiffening beam from said member when it vibrates.

4,566,232

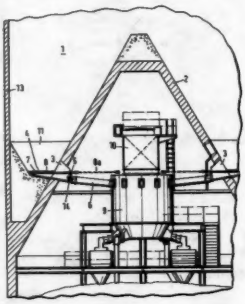
LARGE VOLUME SILO FOR BULK MATERIAL, PARTICULARLY RAW CEMENT POWDER

Heinrich Klein-Albenhausen, Hamburg, Fed. Rep. of Germany, assignor to Ibau Barcelona, S.A., Barcelona, Spain

Filed Dec. 21, 1983, Ser. No. 563,778

Int. Cl.[4] B65G *65/40*

U.S. Cl. 52—195 **5 Claims**



1. A large volume silo for bulk material, particularly raw cement powder, having an annular silo base formed by a conical dome with an inner dome area and discharge openings in the conical dome between the silo area and inner dome area, and a storage tank in the inner dome area, the silo comprising:

(a) open air conveyor chutes passing radially inwards to the discharge openings in the conical dome and being selectively controllable;

(b) closed air conveyor chutes in the inner dome area operatively connecting the open air conveyor chutes to the storage tank; and

(c) cover slides for covering the open air conveyor chutes and separating the open air conveyor chutes in the silo area from the inner dome area.

4,566,233

CEILING CONSTRUCTION

Hiromitsu Naka, Yashio, Japan, assignor to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,263

Claims priority, application Japan, Jul. 11, 1983, 57-127260

Int. Cl.[4] E06B *3/00*

U.S. Cl. 52—208 **6 Claims**

1. A ceiling construction for buildings, comprising:

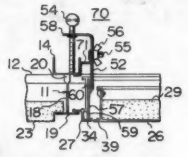
a plurality of flanged main beams disposed in a predetermined spaced relationship to each other and positioned for bridging wall moldings opposed and spaced from each other;

a plurality of flanged cross beams connected to said main beams in a predetermined spaced relationship to each other are right angles to the main beams so as to form a ceiling framework;

a ceiling wall mounted in said ceiling framework and having an access opening in a predetermined position;

a pair of auxiliary beams each positioned on the upper side of the ceiling wall and each bridging the flanges of one of a pair of opposed main beams adjacent to and spaced from each other and a pair of opposed cross beams adjacent to and spaced from each other, said auxiliary beams extending along the edges of said access opening;

an access door means positioned in said access opening and having a stationary frame having an outwardly extending



flange, a movable frame hingedly connected to said stationary frame, and a cover plate fixedly secured to said movable frame; and

a plurality of hanger means securing said access door to said auxillary beams, said hanger means including a carrier plate mountable on said stationary framework for supporting said stationary framework from said hanger means, a clamping plate adjustably mounted in said carrier plate, a threaded fastening means for securing the clamping plate to the carrier plate in an adjusted position thereon, and a threaded clamping bar threaded through said clamping plate and cooperating with said clamping plate for securing the carrier plate to the auxiliary beam.

4,566,234

WINDOW FRAME WITH LAMINATED SURFACES

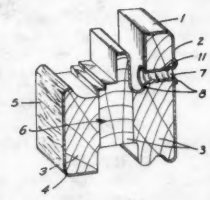
Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,448

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301894

Int. Cl.[4] E06B *3/26*

U.S. Cl. 52—209 **10 Claims**



1. Window frame formed in part of one of wood and wood materials, such as cemented chipboard and the like, with a pressure setting laminate coating, said window frame comprises frame sides each having an interior surface exposed to the conditions within the interior of a building and an exterior surface exposed to the weather conditions on the exterior of a building, said frame sides being joined together at mitered corner joints, each said frame side having a wood core, a metal foil laminate coated on the exterior surface of said wood core, said metal foil laminate comprising a laminated base formed of a plurality of layers of binder-impregnated thick paper heat and pressure bonded to said wood core, and a metal foil ad-

hered to said laminated base, a molding formed of a thin metal foil extends over the mitered corner joints on the exterior corners of said frame side with said molding extending away from the mitered corner joint, said molding being soldered to said metal foil laminate at spaced locations from the mitered corner joints, said molding being corrugated in the region of the mitered corner joint and being free from said metal foil laminate adjacent said mitered corner joints, at least certain of said frame sides having drain bores therein and thin metal pipes lining said drain bores, said thin metal pipes being corrugated in the circumferential direction for affording longitudinal expansion thereof, said thin metal pipes having opposite ends flanged over and soldered to said metal foil laminate, and a decorative laminate coated on the heat and pressure bonded to the interior surface of said frame sides.

4,566,235

TILE BLOCK

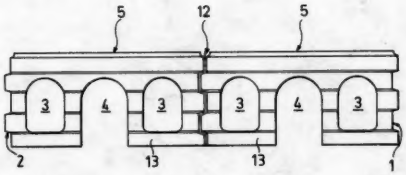
Hartmut Groll, Rettigstr. 4, 7570 Baden-Baden, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,616

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3242942

Int. Cl.⁴ E04B *5/48*

U.S. Cl. 52—220 **16 Claims**



1. A tile block for covering surface areas such as floors and walls, said tile block having a surface section and a lower body portion extending from the tile surface and having downwardly extending side walls so as to define said tile block, said body portion having a plurality of channels formed therein, of which channels some are closed at the tile bottom and some are open but all extend across said lower body portion and are so arranged as to be in alignment with corresponding channels of adjacent tiles when disposed on a support surface, at least two of said channels which are open at the tile bottom extending in a direction normal to one another so as to be capable of receiving pipes disposed on said supporting surface in either of the tiles major orientations to permit variations in the tiling pattern, said side walls being provided with accurately machined tongues and grooves for close interlocking engagement between adjacent tile blocks.

4,566,236

GREENHOUSE STRUCTURE ELEMENT

John A. Pound, 2131 Piedmont Way, Pittsburg, Calif. 94565

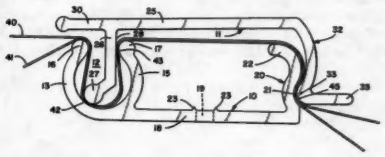
Filed Feb. 9, 1984, Ser. No. 578,750

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—222 **2 Claims**

1. An assembly to hold the edge of a flexible sheet to a structure comprising:

a fixed piece including means to be fixed to said structure, said fixed piece having a cavity opening between an edge and a bearing edge, a first intrinsic lock element spaced from said cavity opening, a locking piece including a sheet engaging element extending from one end thereof, said sheet engaging element including a cavity bearing portion and a cavity edge bearing portion, and a second intrinsic lock element spaced from said sheet engaging element to engage said first lock element in locking relationship when said sheet engaging element is engaged with the interior of said cavity, one of said first intrinsic lock element and second intrinsic lock element having a detent and the



other of said lock elements having a nose spaced and dimensioned to snap into said detent.

4,566,237

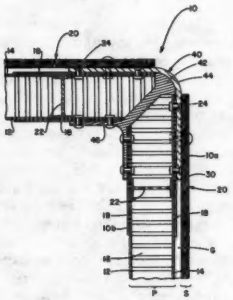
ARMORED PANEL

Patrick E. Turner, Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 8, 1983, Ser. No. 483,345

Int. Cl.⁴ E04B *1/18;* E04H *9/10*

U.S. Cl. 52—269 **7 Claims**



1. A configuration for a lightweight and portable shelter having wall and roof panels armored against ballistic fragment and thermal radiation threats comprises in combination:

vertical and horizontal aluminum alloy corner extrusions defining a cove angle at an inward extent and forming a skeleton framework of the shelter;

inner structural panels supported in the corner extrusions, said structural panels comprising inward and outward facing aluminum alloy sheets bonded to a lightweight honeycomb core, the inward facing sheet mechanically fastened to the cove angle in the corner extrusion;

an extruded aluminum alloy cap angle mechanically fastened to the outward facing sheet of the inner structural panel and covering the corner extrusions forming the framework; and

an outer face panel comprised of a multi-ply laminate of at least seven plies of an aramid fiber fabric in a resin matrix, said face panel overlapping and mechanically fastened to the cap angle extrusion such that a gap of at least 1.5 mm (0.6 inch) is defined as between the face panel and the outward facing aluminum sheet of the inner structural panel.

4,566,238

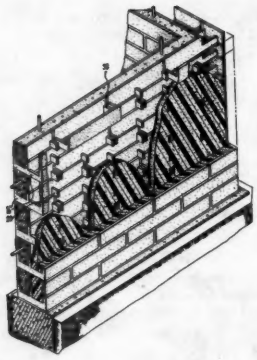
ENERGY CONSERVING CONCRETE MASONRY UNIT, WALL CONSTRUCTION AND METHOD

Peter Janopaul, Jr., 1301 Payne Ave., Modesto, Calif. 95351

Continuation-in-part of Ser. No. 499,674, Jun. 6, 1983, abandoned, which is a continuation of Ser. No. 337,817, Jan. 7, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,654

Int. Cl.[4] E04B *2/26*

U.S. Cl. 52—407 **3 Claims**



1. An energy conserving exterior wall structure of a building for use in passive solar heating and nocturnal cooling of the interior of the building comprising a plurality of masonry units stacked forming a wall in a manner including mortar joints between adjacent stacked units, each masonry unit being defined by an inner side wall, an outer side wall and a partition disposed in spaced relation between the side walls, a plurality of cross webs joining the partition to the side walls in a spaced substantially parallel disposition wherein the partition defines an open inner cell with the inner side wall and an open outer cell with the outer side wall, the cross-sectional area of the cross webs occupying less than substantially ten percent of the overall area of the side walls for minimizing heat transfer between the side walls, the inner cells collectively defining a continuous interior wall space, a fluid material settable to form a thermal mass and structural body disposed within and substantially filling the entire interior wall space, said structural body in conjunction with said inner side walls and said partitions forming the structural portion of said exterior wall, the outer cells collectively defining a continuous exterior wall space, and an expansible insulation material foamed in place within and substantially filling the entire exterior wall space, said insulation material serving to seal said exterior wall space in response to expansion of said insulation.

4,566,239

INSULATION SYSTEM

Robert L. Smigel, 700 Brick Mill Run, Westlake, Ohio 44145, and Kenneth J. Paliwoda, 16937 Lanier Ave., Strongsville, Ohio 44136

Filed Oct. 3, 1983, Ser. No. 538,511

Int. Cl.[4] E04B *1/74*

U.S. Cl. 52—407 **12 Claims**

1. An insulation system for use in a building having a plurality of roof panels connected with longitudinally extending structural members, said insulation system comprising a body of insulating material, an elongated flexible sheet means forming a vapor barrier, said flexible sheet means having a central portion for supporting said body of insulating material beneath a roof panel and having first and second longitudinally extending edge portions projecting outwardly from opposite longitudinal edges of said body of insulating material for distances which are greater than the thickness of the body of insulating

material, and connector means for releasably connecting the first and second edge portions of said flexible sheet means with a pair of adjacent structural members to thereby adjustably suspend said body of insulating material beneath a roof panel.

4,566,240

COMPOSITE FLOOR SYSTEM

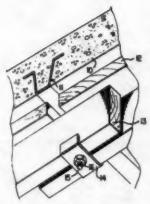
Herbert K. Schilger, 32 Castlegien Ct., NE., Calgary, Alberta T3J 2B8, Canada

Filed Mar. 8, 1984, Ser. No. 587,542

Claims priority, application Canada, Mar. 11, 1983, 423447

Int. Cl.[4] E04B *1/18*

U.S. Cl. 52—414 **5 Claims**



1. A composite floor system comprising a concrete slab and a metallic reinforcing and support section mechanically embedded in said slab, said support section comprising an elongated unitary strip having a substantially flat central web portion containing a plurality of spaced holes, a pair of substantially flat leg portions extending away from the sides of said web, and an edge flange extending outwardly from the outer end of each leg portion and at least the leg portions and the edge flanges being embedded in the concrete with the web being adjacent a face of the slab and support bolts mounted within said web portion holes and extending outwardly from said slab, said edge flanges being mechanically interlocked with the concrete in both longitudinal and lateral directions, providing shear strength and rigidity for the floor system.

4,566,241

PROGRESSIVE DEMOUNTABLE PARTITION

Joseph W. Schneller, Williamsville, N.Y., assignor to National Gypsum Company, Dallas, Tex.

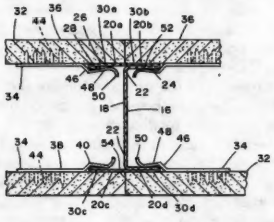
Filed Apr. 4, 1984, Ser. No. 596,635

Int. Cl.[4] E04H *1/00*

U.S. Cl. 52—481 **10 Claims**

1. A wallboard fastener clip comprising a single almost flat sheet metal body from which a plurality of short tangs are partially cut and bent perpendicularly therefrom, said almost flat body including a wallboard-engaging rearward flat portion and a flange-engaging forwardly extending, forward, almost flat portion disposed slightly out of the plane of said rearward flat portion and extending away from said rearward portion, said plurality of tangs being elongate, narrow strips of sheet metal cut from the sheet metal of said rearward flat portion and extending perpendicularly from said rearward flat portion in a

direction opposite to the side of said flat portion on which said forwardly extending portion is disposed, said forwardly extending portion having a stud flange contacting portion which is disposed slightly outside of the plane of said rearward flat portion.

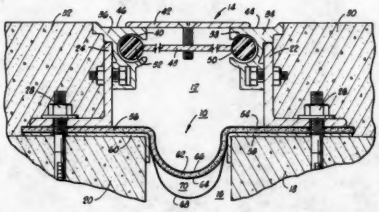


4,566,242

SMOKE AND HEAT BARRIER

Charles L. Dunsworth, Midwest City, Okla., assignor to Metalines, Inc., Oklahoma City, Okla.

Filed Dec. 2, 1983, Ser. No. 557,483
Int. Cl.[4] E04B *1/68*
U.S. Cl. 52—573 **7 Claims**



1. An expansion joint assembly including fire barrier for disposition across an expansion void between expansible, adjoining first and second panel strutures, comprising:

an expansion joint including first and second brackets and guide members secured along first and second panel structures with guidebar means slidingly secured to said first and second panel structures and pivotally secured to said expansion cover to maintain the expansion cover in secure sliding engagement over said first and second bracket and guide members; a resilient ceramic felt sheet sealingly secured by said first and second bracket and guide members to extend between said first and second panel structures in spaced relationship from said expansion cover; and

a first refractory cloth sheet sealingly secured between said first and second panel structures and disposed generally contiguous to said ceramic felt sheet;

whereby the widths of said ceramic felt sheet and refractory cloth sheet is each markedly greater than the distance across the expansion void.

4,566,243

PLANK GRATING ASSEMBLY

Robert D. Dahlin, Hillsborough County, Fla., assignor to Benchcraft, Inc., Brentwood, Mo.

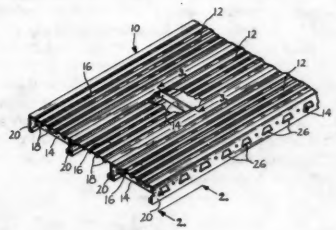
Continuation of Ser. No. 403,029, Jul. 29, 1982. This application Nov. 21, 1984, Ser. No. 673,861
Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—584 **12 Claims**

1. A plank grating arrangement comprising:

a plurality of elongate planks each having a deck panel and flanges on opposite sides of each panel, said planks being adapted to be arranged side by side with the panels cooperating to form a substantially continuous load bearing deck surface and with flanges of adjacent planks being disposed against one another;

a plurality of spaced apart openings in the flanges of each plank, each opening having a lateral dimension defined between side edges of the opening and a vertical dimension defined between upper and lower edges of the opening; and

a plurality of removable braces each long enough to span the flanges of each plank and each having opposite end portions presenting slot means therein, each brace being insertable through aligned openings in the plank flanges



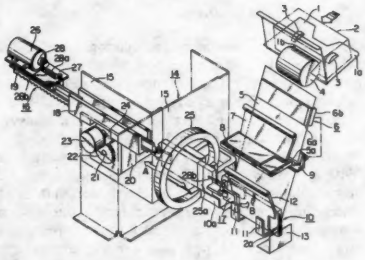
with a heat dimension of the brace oriented generally parallel to the lateral dimensions of the openings and being thereafter rotatable in the openings to an assembled position wherein the height dimension of the brace is oriented generally parallel to the vertical dimensions of the openings and said upper and lower edges of the openings in adjacent flanges fit closely in said slot means to rigidly connect the planks together for formation of the load bearing deck surface with the braces immediately underlying and in contact with the deck panels to receive loads applied thereto and the adjacent flanges of the planks held together in contact with one another by the fit of said upper and lower edges of the openings in said slot means, said braces being removable from said slot means.

4,566,244

PAPER SHEET GRIP AND TRANSFER APPARATUS

Hikaru Kawano, Odawara, and Koji Sato, Hiratsuka, both of Japan, assignors to Musashi Engineering Kabushiki Kaisha, Tokyo and Hitachi Denshi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Apr. 19, 1984, Ser. No. 601,795
Claims priority, application Japan, Apr. 30, 1983, 58-76488
Int. Cl.[4] B65B *35/50*
U.S. Cl. 53—588 **4 Claims**



1. In a paper sheet counting and half-wrapping device of the type comprising a stack unit for receiving a plurality of paper

sheets supplied thereto and stacking them as a bundle to be wrapped, said stack unit providing exposure of a free end of the bundle when stacked thereon, counting means for counting the number of said sheets in said bundle, and a half-wrapper unit including a half-wrapper ring mounted adjacent to said stack unit for receiving said bundle and wrapping the same when said bundle is transferred to within said ring from said stack unit, the improvement comprising a sheet bundle grip and transfer apparatus comprising a longitudinally movable member having an end carrying an openable and closable gripping chuck thereon, said movable member being mounted substantially on said half-wrapper unit for reciprocal movement through said half-wrapper ring between a first position wherein said chuck is on one side of said ring adjacent to said bundle free end for gripping the same and a second position wherein said chuck is on the opposite side of said ring whereby said bundle gripped by said chuck is within said half-wrapper ring to be wrapped therein, means normally retaining said chuck in its opened position when said movable member is in its said first position, means actuatable responsive to said counting means for closing said chuck on said bundle to grip the same in said first position of said movable member when a predetermined number of said sheets are within said bundle, and drive means actuatable responsive to said closing of said chuck for moving said movable member from its said first position to its second position.

4,566,245

COLLAPSIBLE CONSTRUCTION ASSEMBLY

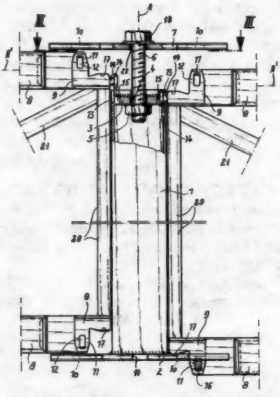
Ewald Rüter, Dortmund, Fed. Rep. of Germany, assignor to E. Rüter GmbH, Dortmund, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,257

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222811

Int. Cl.[4] E04H *12/18*

U.S. Cl. 52—645 **6 Claims**



1. A construction assembly for making a collapsible structure, the assembly comprising:

an elongated post extending along and defining a normally upright post axis and having an upper end and a lower end, the upper end being formed with a transverse web having an axially centered threaded bore open in an upward axial direction away from the lower post end and with an axially upwardly open notch;

a lower planar plate fixed at the lower end of the post, extending generally perpendicular to the post axis, and formed with at least one axially throughgoing lower cutout offset from the post axis and radially offset relative thereto from the post;

a frame having

a lower fitting formed with an axial projection extending axially down through the lower cutout and formed directly underneath the lower plate with a passage that is throughgoing parallel to the lower plate, and

an upper fitting at the upper post end and formed with an upper projection extending axially upward away from the lower post end and provided with a stud extending through the notch and having inside the post a stud head larger than the notch, whereby the stud secures the upper fitting on the post against downward or horizontal movement relative thereto;

a locking member engaged through the passage and bearing axially upward toward the upper end on the lower plate;

an upper planar plate extending generally perpendicular to the post axis, formed at the axis with a throughgoing bore and offset from the axis with an axially throughgoing cutout through which extends the upper projection of the upper fitting; and

a bolt threaded in the bore of the web, passing through the bore of the upper plate, and having a bolt head bearing axially downward on the upper plate, whereby the bolt head presses the upper plate down on the upper fitting to lock the frame to the post.

4,566,246

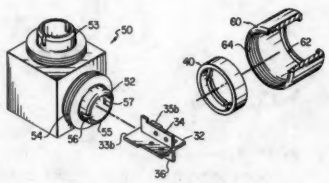
MODULAR STRUCTURE ASSEMBLIES

George F. Sanger, 211 Confederate Way, Seabrook, Harris, Tex. 77586

Filed Jun. 11, 1984, Ser. No. 619,230

Int. Cl.[4] E04B *7/06*

U.S. Cl. 52—648 **8 Claims**



1. In a connector assembly for a modular construction, the combination comprising:

a. an elongated key member having a plurality of longitudinal ribs having radially extending detent protrusions at the ends thereof, at least one of said detent protrusions extending longitudinally rearwardly of the other of said detent protrusions;

b. an adapter collar having an annular internal shoulder provided with a plurality of slots therein conforming to the detent protrusions of said key member whereby said adapter collar is slideable over the end of said key member when said slots and detent protrusions are aligned and having at least one additional slot displaced angularly from said conforming slots and adapted to receive said at least one of said detent protrusions upon the angular displacement of said adapter collar relative to said key member whereby said adapter collar is secured against removal from the end of said key member;

c. a spode unit having a connecting joint;

d. a retaining collar adapted to fit over said key member and said adapter collar and having an internal shoulder adapted to abut against said adapter collar from the rear and a forward portion adapted to be connected to the union joint of the spode unit;

e. cooperative connecting means on said retaining collar and said spode unit connecting joint for securing said retaining collar and said connecting joint against relative movement longitudinally of said key member;

f. and means cooperatively associated with said spode unit

connecting joint and at least one of said key member and said adapter collar for securing said key member and said spode unit joint whereby said key member and said spode unit joint are locked in a torsional stress bearing relationship.

4,566,247

CAPTIVE COLUMN

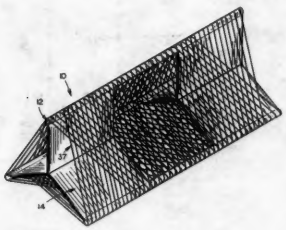
Gordon I. Overbo, 302 16th Ave. S., Devils Lake, N. Dak. 58301

Continuation-in-part of Ser. No. 519,980, Aug. 3, 1983, Pat. No. 4,539,785. This application Feb. 13, 1984, Ser. No. 579,270

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.⁴ E04C *3/10, 3/30*

U.S. Cl. 52—732 **5 Claims**



1. An elongated captive column structure comprising,

a plurality of transversely spaced-apart elongated column portions,

a plurality of longitudinally spaced-apart compression core members interconnecting said column portions along the lengths thereof,

and oppositely wound helical winding extending around the columns.

4,566,248

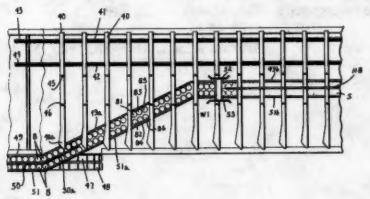
PACKAGING APPARATUS AND METHOD

Jack S. Cooley, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 538,174, Oct. 3, 1983, abandoned, which is a division of Ser. No. 318,828, Nov. 6, 1981, Pat. No. 4,481,750. This application Nov. 14, 1984, Ser. No. 671,031

Int. Cl.⁴ B65B *21/24, 35/44*

U.S. Cl. 53—48 **3 Claims**



1. A machine for packaging a group of articles in a wrap-around carrier blank which is horizontal initially and which is initially disposed above said group of articles, said machine comprising a horizontal elongated fixed support having infeed and outfeed ends, a plurality of transverse parallel spaced metering bars disposed above said fixed support and having corresponding ends on one side of said fixed support connected with endless means above said fixed support and on said one side for supporting and moving said bars in an advancing direction from a point adjacent the infeed end thereof toward the outfeed end thereof and with the free ends thereof on the other side of said fixed support, infeed conveyor means disposed on the side of said fixed support opposite from that on which said corresponding ends of said metering bars are disposed, fixed primary guide means disposed on the side of said fixed support which is opposite from that at which corresponding ends of said metering bars are secured to said endless means and said primary guide means being disposed at an acute angle to said advancing direction for receiving articles from said infeed conveyor means and for guiding said articles into the space between the free ends of said metering bars, fixed secondary guide means arranged in parallel relation to said elongated fixed support and disposed thereabove and in parallel relation to said advancing direction of each endless means for receiving the articles from said primary guide means, folding means disposed above said fixed secondary guide means for engaging the side walls of a carrier blank while horizontal and for folding the side walls and associated parts of the blank downwardly and between a pair of adjacent metering bars, and means movable in substantial unison with the carrier and the group of articles for tightening the blank about the articles while disposed between said metering bars and while moving on said support.

4,566,249

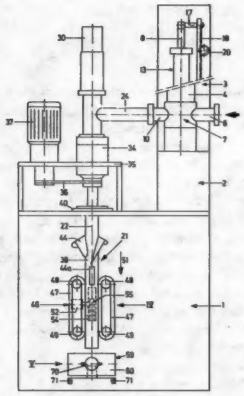
APPARATUS FOR THE DOSED FILLING OF HIGHLY VISCOUS MATERIAL

Ernst Schwerdtel, Am Blütenanger 24, D-8000 München 50, and Hans-Jörg Lang, Haus No. 61, D-8061 Biberbach, both of Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,957

Int. Cl.⁴ B65B *3/02, 3/32, 9/20, 59/02*

U.S. Cl. 53—55 **6 Claims**



1. An apparatus for the dosed filling of highly viscous material, into tubular bags, said apparatus comprising:

a dosing device for said viscous material comprising a dosing cylinder, a drivable dosing piston mounted within said dosing cylinder, and a pick-up connected to said dosing piston to detect the exact position of said dosing piston, whereby the quantity of the dosed material is determined;

a material filling device, said filling device having a filling tube, a foil format tube and a rotary tube;

said filling tube having one end connected to the dosing device to receive said viscous material therefrom and a valve at the other end, said foil format tube being circumferentially arranged around said filling tube;

said rotary tube being arranged between said filling and the format tube, said rotary tube having at its lower end at least one cutting wire positioned at the other end of said filling tube; and

said filling tube valve being approximately flush with said cutting wire when said valve is closed;

a conveying means mounted adjacent said format tube to convey a formed foil tube along said format tube;

A transverse welding means having a cutting device and positioned below said filling device.

4,566,250

METHOD AND APPARATUS FOR PRODUCING BAG-SHAPED PACKAGES WITH CAP BODY AND CONTENT

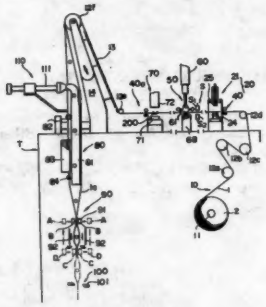
Wakuo Matsumura, Hirakata; Noboru Kitazawa, Kyoto, and Yoshiaki Ohigashi, Uji, all of Japan, assignors to Unitika Ltd., Japan

Filed Oct. 17, 1983, Ser. No. 542,683

Claims priority, application Japan, Oct. 18, 1982, 57-181264; Nov. 18, 1982, 57-201171; Jan. 31, 1983, 58-12792; Feb. 14, 1983, 58-21603; Sep. 9, 1983, 58-165144

Int. Cl.[4] B65B *61/00*

U.S. Cl. 53—128 8 Claims



1. An apparatus for producing bag-shaped packages respectively with a cap body and filled with fluid content from an elongated thin film of synthetic resin which comprises:

a film supplying section having a film roller for feeding said film with marks at intervals defining respectively package forming areas;

a horizontally conveying section for said film from said film supplying section, said horizontally conveying section including a punching means for punching out a hole in said film one by one at each package forming area, a cap body feeding means for successively fitting cap bodies having a flange into each punched hole by passing a cap body through each punched hole and a cap securing means for heat sealing of said flange of said cap body to said film;

said horizontally conveying section further including a pair of film holder means between which are provided at least said cap body feeding means and said cap securing means for intermittently holding said film stationarily and means to open and close said holder means;

a sensor means for detecting said marks of said film for controlling the opening and closing of said film holder means; and

a vertically downwardly conveying section adapted to convey said film secured with said cap bodies at respective package forming areas vertically downwardly, said vertically downwardly conveying section including a longitudinal heat sealing means for shaping said film into tubular form, a transverse heat sealing means for making bottom and top sealing lines on said tubular film at respective package forming areas, a content supplying means for supplying fluid content to said tubular film after formation of said bottom sealing line, a driving means for downwardly sending the shaped package after forming the upper sealing line by said transverse heat sealing means when said holding means are open, and a cutting means for cutting along respective transverse sealing lines.

4,566,251

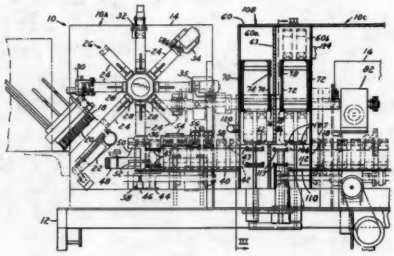
CARTON FORMING, STERILIZING, FILLING AND SEALING MACHINE

Anthony F. Spisak, Redford; Sava Stefanovic, Southfield, and Curtis H. Pawloski, Pontiac, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Jan. 7, 1985, Ser. No. 689,355

Int. Cl.[4] B65B *55/10*

U.S. Cl. 53—167 7 Claims



1. A modular forming, sterilizing, filling and sealing machine for containers, said machine comprising a front bottom forming and sealing section; an intermediate sterilizing section; and a rear filling, top forming and sealing section; and separate conveyor means in each section, said conveyor means in said sterilizing section adapted to receive the containers from said conveyor means in said bottom forming and sealing section in an upright, open-topped condition and conveying same transverse to the line of travel in said forming and sealing sections through a sterilant vapor atmosphere wherein the sterilant vapor condenses on all surfaces of each upright, open-topped container, and then rotating the containers from the upright position to an upside-down condition through a heated and air blown atmosphere, and back to an upright condition onto said conveyor means in said filling, top forming and sealing section.

4,566,252

METHOD FOR AUTOMATIC PACKING OF ARTICLES CAPABLE OF PROVIDING PLASTICS PACKING BAG WITH REINFORCED HANDLE PORTION

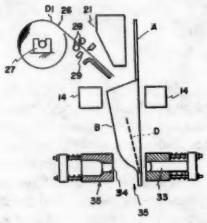
Hideyuki Watanabe, and Yoshimitu Ichikawa, both of Tokyo, Japan, assignors to Taiyo Shokai Co., Ltd., Japan

Filed Mar. 14, 1984, Ser. No. 589,334

Claims priority, application Japan, Mar. 18, 1983, 58-45691

Int. Cl.[4] B65B *9/13, 9/20, 61/20*

U.S. Cl. 53—410 6 Claims



1. In a process for the automatic packing of articles comprising the steps of: intermittently moving a tubular bag material of

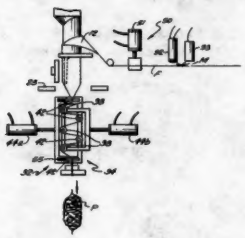
heat-sealable thermoplastic synthetic resin during active time periods having inactive periods therebetween by a distance corresponding to the length of a single bag to be formed using intermittent conveyor means; heat-sealing said bag material transversely thereacross with respect to a moving direction of said bag material to form at its leading end portion a depending foremost bag section for packing of articles during each inactive period of said intermittent conveyor means; charging goods into the depending foremost bag section of said bag material; heat-sealing an upper portion of the goods-charged depending foremost bag section transversely thereacross; and separating the sealed bag section from a subsequent bag section of said bag material, the improvement comprising the steps of; supplying a reinforcing material into the depending foremost bag section and placing the reinforcing material between opposite walls of the bag section at a region adjacent a transversely extending lower seal of said foremost bag section, said reinforcing material having greater material strength than that of said bag material so as to provide said region with a greatly reinforced handle portion; and forming an opening for suspension of an individual sealed bag section to be produced, by piercing through said walls and said reinforcing material placed therebetween by punch and die means; said steps of supplying a reinforcing material into said foremost bag section and placing it between said walls at said region and forming said opening being performed immediately before the goods are charged into said foremost bag section during each inactive period of said intermittent conveyor means, whereby individual sealed bag sections each having a reinforced handle portion with an opening for suspension can be automatically successively obtained.

4,566,253

PACKAGING SYSTEM WITH INTERDIGITATING FILM ADVANCE

Robert W. Jones, Atlanta, Ga., assignor to Kliklok Corporation, Greenwich, Conn.

Filed May 23, 1984, Ser. No. 613,229
Int. Cl.[4] B65B *9/10, 41/12*
U.S. Cl. 53—451 **19 Claims**



1. An apparatus for the packaging of bulk material, comprising:

means for forming a continuous film into a tube;

means for delivering a charge of the bulk material to a package being formed from said tube;

means for sealing and cutting said tube containing the bulk material into the package; and

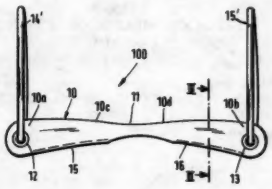
interdigitating means, positioned between said forming means and said cutting and sealing means, for engaging opposite sides of said tube and forming an elongated zigzag path for advancing said film over said forming means.

4,566,254

BIT FOR HORSES

Reimer Nagel, Schulstrasse West 16, 2228 Friedrichskoog, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,646
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 8405615[U]; Jul. 13, 1984, 8420952[U]; Jul. 19, 1984, 8421548[U]; Sep. 21, 1984, 8427836[U]
Int. Cl.[4] B68B *1/06*
U.S. Cl. 54—8 **8 Claims**



1. A bit for horses, having a one-piece bit bar, said bit bar comprising, in combination:

two outer portions, each having an inner end and an outer end, each of said outer portions widening from the corresponding inner end to the corresponding outer end in a lobar manner, and having a smooth, sliding face-like surface with a substantially round cross-section,

each of said outer portions being made of an elastic, material means having (a) a high abrasion resistance, (b) being pressure-deformable and (c) recovering its original shape free of any rebound elasticity,

each of said outer ends having a through bore adapted to accept a corrosion-resistant ring for passing reins therethrough, said outer portions being so oriented that the axes of said through bores lie in an imaginary plane, and

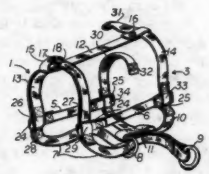
a narrow, small diameter, resilient, elastic web connecting said inner ends to one another so that said outer portions and said web together form a one-piece bit bar, said bit bar being provided on either side of the web with flattened horse tongue contact faces parallel to said imaginary plane defined by said axes of said through bores, said web being free of flattened contact faces.

4,566,255

TRAINING HALTER FOR CANINES

Alice A. DeGroot, 1768 Village Run North, Encinitas, Calif. 92024

Continuation-in-part of Ser. No. 467,316, Feb. 17, 1983, Pat. No. 4,483,275. This application Jul. 2, 1984, Ser. No. 627,011
Int. Cl.[4] B68B *1/02;* **A01K** *15/00*
U.S. Cl. 54—24 **6 Claims**



1. A training halter for a dog, comprising:

(a) a loop member for encircling the dog's muzzle;

(b) a collar member for encircling the dog's head;

(c) a pair of side members for securing the collar member to the loop member on opposite sides of the dog's head; wherein the forward end of each side member comprises a slip loop, and wherein said loop member comprises an

upper portion and a lower portion, each portion having a loop at each end, and said slip loops at the forward ends of said side members engage through said loop on adjacent ends of said upper and lower portions on opposite sides of said muzzle;

(d) means for securing upper portions of the loop and collar members together;

(e) means for cinching the loop member;

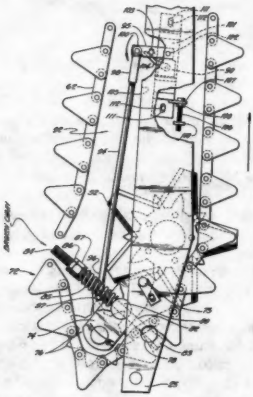
(f) means for securing a leash to the cinched loop member.

4,566,256

SAFETY INTERLOCK MECHANISM FOR CORN HEAD ASSEMBLY

Eugene A. Sousek, Appleton, Wis., assignor to Piper Industries, Inc., Dallas, Tex.

Filed Sep. 9, 1983, Ser. No. 531,151
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—10.2 3 Claims



1. A safety interlock system for a crop gathering and conveying apparatus on a support assembly of a row-crop harvester, comprising:

a pivotally mounted idler arm and guide means on said support assembly;

an endless gathering member engaged over said guide means;

drive means for moving said gathering member;

spring means urging against said idler arm and tensioning said gathering member;

circuit means including a safety switch responsive to the movement of said idler arm; and

interrupter means controlled by said safety switch to interrupt power from said drive means to said gathering member upon movement of said idler arm by said spring means when said gathering member becomes loose or breaks, thereby preventing damage to said harvester from said member;

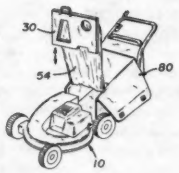
said safety switch being connected to said idler arm by linkage means including a pivotally mounted actuator lever engaging said safety switch for activation when said gathering member is loose or broken and a tie rod extending along said support assembly between the actuator lever and the idler arm; said support assembly including an interior compartment, said actuator lever and safety switch being located substantially inside said compartment free from dirt and debris associated with the crop being harvested and protected from damage typically caused by battering from said crop as said crop is transported up said support assembly by said gathering member.

4,566,257

LAWN MOWER DISPOSABLE GRASS COLLECTION BAG ATTACHMENT

Mohammad Akrabawi, 1625 Carlisle La., DeKalb, Ill. 60115

Filed Jun. 29, 1984, Ser. No. 626,460
Int. Cl.[4] A01D *35/22*
U.S. Cl. 56—202 8 Claims



1. An attachment for a lawn mower of the type that propels clippings from an operating zone through a discharge opening, comprising:

transfer plate for easy manual releasable attachment to the mower for receiving propelled air and clippings from the mower when attached thereto; and

means for releasably affixing the marginal edge of the opening of a disposable bag to said transfer plate such that the bag receives the propelled air and clippings from said manually releasable transfer plate;

said manually releasable transfer plate also including vent means for allowing air to be vented from the disposable bag;

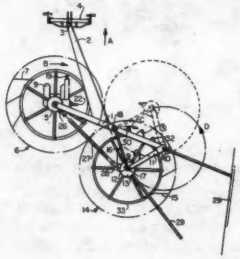
such that when attached to an operating lawn mower with a disposable bag so affixed, clippings are propelled through the transfer plate into the disposable bag and there accumulated so that they can be disposed of and removed by manually removing the transfer plate and its attached disposable bag, and thereafter detaching the filled bag from the transfer plate away from the lawn mower.

4,566,258

DEVICE FOR WORKING CROP LYING ON THE GROUND

Petrus M. Quataert, Nuenen, Netherlands, assignor to P. J. Zweegers en Zonen Landbouwmachine Fabriek B.V., Geldrop, Netherlands

Filed Jun. 20, 1983, Ser. No. 505,736
Claims priority, application Netherlands, Jul. 9, 1982, 8202785
Int. Cl.[4] A01D *78/10*
U.S. Cl. 56—370 11 Claims



1. A device for working corp lying on the ground having a frame comprising a frame beam extending transverse to the intended direction of travel, and a draw bar fixed to said frame beam and extending forwardly from said frame beam, a first

gear box fixed to one end of said frame beam, an arm having one end pivotally coupled with the other end of said frame beam so as to be adjustable with respect to said frame beam about a substantially vertical pivot axis, a second gear box being pivotally mounted to the free end of said arm so as to be adjustable about a substantially vertical pivot axis with respect to said arm, a coupling rod coupled with said second gear box for fixing the arm and said second gear box in various positions on either side of said frame beam, a pair of tined rake wheels rotatable about upwardly extending rotary shafts and each drivable respectively via said gear boxes, means for reversing the direction of rotation of one of said driven rake wheels, the device being such that in a first position of said arm the rake wheel at the free end of the arm is disposed in front of the frame beam and said rake wheel can be driven in such a direction that viewed in the direction of movement the tines on the proximal sides of the rake wheels move to the rear, and in a second position of said arm viewed in the intended direction of travel the rake wheels are located obliquely one behind the other and can be driven in the same direction and the rake wheel on the free end of the arm is disposed behind the frame beam, the first gear box is provided with an input shaft to be coupled with the aid of an auxiliary shaft with the power take-off shaft of a tractor, said input shaft being coupled through a gear wheel transmission with a first output shaft, which protrudes out of the first gear box and which is provided at the other end with a first bevel gear wheel which is in mesh with a second bevel gear wheel located below the first bevel gear wheel and fastened to the respective rake wheel and with a neighbouring bevel gear wheel fastened to a second output shaft protruding out of the gear box and being arranged above the second gear wheel secured to the rake wheel in a manner such that it rotates free of the second gear wheel one of the ends of the output shafts emerging from the first gear box can be coupled selectively with the aid of an auxiliary shaft with one end of a shaft journalled in the second gear box secured to the first end of the arm.

4,566,259

METHOD AND APPARATUS FOR THE MANUFACTURE OF FANCY YARNS

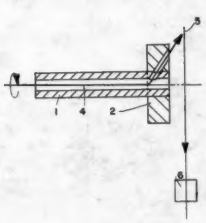
Marc Durand, Decines, France, assignor to Chavanoz S.A., Pont-de-Cheruy, France

Filed Feb. 7, 1984, Ser. No. 577,803

Claims priority, application France, Feb. 10, 1983, 83 02288

Int. Cl.⁴ D02G *3/34, 3/36, 3/38*

U.S. Cl. 57—6 **3 Claims**



1. Apparatus for use in the production of a fancy yarn, said apparatus comprising means for feeding at least one yarn along a path, a rotating component positioned adjacent said path and rotatable about an axis which is trnsverse to said path, a yarn guiding portion on said rotating component which is spaced from said axis and means to feed a further yarn to said yarn guiding portion, whereby said further yarn is caused to perform a reciprocating, oscillating motion with respect to said at least one yarn, wherein said rotating component comprises a hollow shaft and a radial disc located at one end of said hollow shaft, adjacent said path, and wherein an oblique passage is formed between the hollow interior of said shaft and a point on said disc spaced from the axis of the shaft, whereby said further yarn may be guided through the hollow interior of said shaft and through said passage to said point which thus forms said yarn guiding portion.

3. A method for producing a slub fancy yarn, said method comprising the steps of feeding a core yarn along a path, feeding an effect yarn through a way comprising a hollow shaft of a rotating component and an oblique passage in a radial disc located at one end of said rotating component near the path of said core yarn and on an axis transverse to said path, and rotating said component and said radial disc, the rotation causing the effect yarn to perform a reciprocating, oscillating motion along the path of the core yarn in order to produce slubs periodically along the said core yarn.

4,566,260

PNEUMATIC YARN SPLICING DEVICE

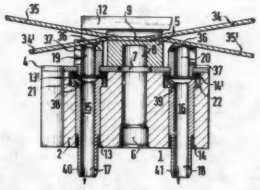
Wolfgang Irmen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,563

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326966

Int. Cl.⁴ D01H *15/00*

U.S. Cl. 57—22 **5 Claims**



1. Pneumatic yarn splicing device for the production of a knotfree yarn joint by means of splicing, comprising a splicer head having at least one inlet formed therein for the injection of compressed air, said splicer head receiving the yarn ends to be spliced together and allowing the entanglement, interlocking, intermingling and/or intertwining of their fibres with one another, pneumatic holding devices arranged on either side of said splicing head, each respective pneumatic holding device having an inlet mouth and a tubular inlet for holding the respective yarn ends of the yarn to be spliced together during the yarn preparing process, the inlet mouths of the pneumatic holding device being provided with inserting aids for the yarn ends in the form of recesses of varying depth.

4,566,261

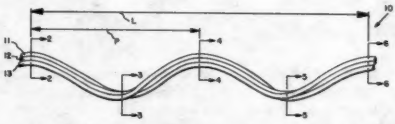
METALLIC CABLE AND APPARATUS FOR MANUFACTURING THE SAME

Dennis R. Brandyberry, Canton, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 14, 1984, Ser. No. 650,483

Int. Cl.⁴ D02G *3/48;* D07B *1/00, 3/00*

U.S. Cl. 57—212 **10 Claims**



1. A metallic cable for reinforcing an elastomeric article comprising two or more substantially identical helically shaped metallic filaments positioned beside and against one other such that each filament is in contact with at least one

other filament, the helixes formed by said filaments having a pitch length, and said filaments being twisted together such that said cable has a lay length that is at least two times greater than said pitch length.

4,566,262

METHOD AND APPARATUS FOR MONITORING THE OPERATION OF A FRICTION FALSE-TWISTING UNIT

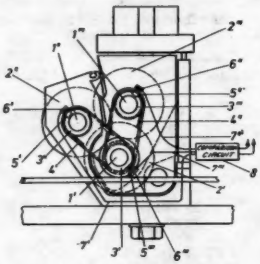
Wolfgang Schmucker, Hammelburg, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Filed Nov. 16, 1983, Ser. No. 552,282

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245574

Int. Cl.[4] D02G *1/04;* D01H *13/14*

U.S. Cl. 57—264 23 Claims



1. A method for monitoring the texturing process in a friction false-twisting unit wherein the unit has three drive shafts, the axes of the drive shafts forming a triangle, each drive shaft bearing at least one friction disk and the disks on the shafts being interleaved,

the method comprising:

rotating the shafts for rotating the disks; passing a thread through the interleaved friction disks in a zig-zag path;

sensing the respective speeds of rotation of at least two of the drive shafts and comparing each of the respective sensed speeds with a reference value; and

producing a fault signal when one of the respective sensed speeds differs from the reference value.

4,566,263

DEVICE FOR STORAGE OF EMPTY BOBBINS FOR A SPINNING FRAME

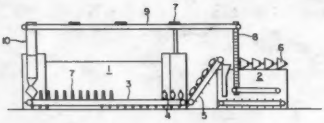
Tsutomu Miyazaki, Kariya; Tatemi Fukuda, Aichi, and Kazuya Yoshimine, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jan. 23, 1984, Ser. No. 573,046

Claims priority, application Japan, Nov. 4, 1983, 58-171467

Int. Cl.[4] D01H *9/18, 9/14;* B07C *5/00*

U.S. Cl. 57—276 9 Claims



1. Empty bobbin storage device in a spinning frame comprising conveyor means mounted above the spinning frame and adapted for restoration to the spinning frame of empty bobbins discharged from a winder associated with the spinning frame, said bobbins having predetermined length and width dimensions and the length dimension being greater than the width dimension, guiding means having a passage for guiding the thus returned empty bobbins to empty-bobbin supply sections associated with automatic bobbin change means annexed to the spinning frame, said passage having an input end adjacent said conveyor and an output end and having a branch point intermediate said input end and said output end to provide left and right passage sections extending from said branch point towards left and right sides of the spinning frame, and distributing means associated with said branch point for selectively distributing the empty bobbins into one or the other of said passage sections, characterized in that, said left and right passage sections have, below said branch point, storage sections for storing a plurality of said empty bobbins, said storage sections, in a cross-section transverse to the direction of movement of the bobbins from said branch point to said output end, having a passage width dimension at least equal to the length dimension of a bobbin and a dimension transverse to said passage width dimension at least equal to the width dimension of a bobbin but less than the passage width dimension whereby each of the bobbins is stored in said storage sections with its length dimension extending in the horizontal direction.

8. Empty bobbin storage device in a spinning frame comprising conveyor means mounted above the spinning frame and adapted for restoration to the spinning frame of empty bobbins discharged from a winder associated with the spinning frame, and a passage for guiding the thus returned empty bobbins to empty-bobbin supply sections associated with automatic bobbin change means annexed to the spinning frame characterized in that, halfway in said passage, there are provided a branch point for branching said passage towards left and right sides of the spinning frame for providing two guide passage sections, and means associated with said branch point for selectively distributing the empty bobbins into one or the otner of said guide passage sections, and in that, halfway in the left and right guide passage sections, and below said branch point, there are provided storage sections for storing said empty bobbins in horizontal position, said storage sections being zigzag-shaped conduits and each said storage section comprising an upper limit senser for empty bobbins, a lower limit senser for empty bobbins, and separation and forwarding means for empty bobbins extending downwardly of said upper and lower limit sensers.

4,566,264

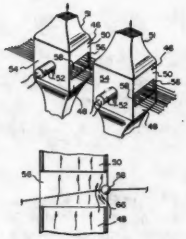
MANUFACTURE OF TELECOMMUNICATIONS CABLE CORE UNITS

John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 3, 1984, Ser. No. 637,587

Int. Cl.[4] B65H *57/06;* D01H *1/04, 7/48*

U.S. Cl. 57—314 12 Claims



1. Apparatus for forming a core unit from telecommunications conductor units, each formed of twisted together insulated conductors and in which the relative positions of the conductor units are changed along the core unit, the apparatus comprising in order, downstream along a feedpath for the units:

guide means to ensure that conductor units are not stranded together;

position changing means for conductor units including a plurality of independent guides for the units, the guides movable independently of each other in any direction and within confines of a certain space extending laterally of the feedpath under the influence of a fluid force, and fluid force producing means to apply a fluid force across the feedpath to cause the independent movement of the guides; and

a core unit forming and take-up means to draw the conductor units together to form the core unit.

4,566,265

TEXTILE PROCESSING APPARATUS

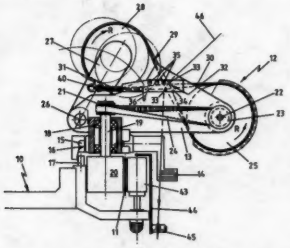
Geoffrey Naylor, Macclesfield, United Kingdom, assignor to Rieter-Scragg Limited, Cheshire, United Kingdom

Filed Jul. 16, 1984, Ser. No. 631,175

Claims priority, application United Kingdom, Aug. 6, 1983, 8321249; Feb. 16, 1984, 8404066

Int. Cl.⁴ D02G *1/04*

U.S. Cl. 57—336 **18 Claims**



1. Apparatus for twisting a running yarn comprising a support structure, first and second pulleys mounted on said support structure for rotation about spaced, substantially parallel respective first and second axes and each having a periphery lying substantially in alignment with the periphery of the other pulley, means for driving one of said pulleys in rotation, an endless belt passing around said peripheries so as to provide two runs each of which is twisted through substantially 180° and crosses the other of said twisted runs to form a nip therewith as it passes between the peripheries of said first and second pulleys, guide means for guiding a running yarn between said twisted belt runs in the region of said nip, an arm pivotally mounted on said support structure to pivot about a pivot axis thereof and on which one of said pulleys is mounted, biassing means operable to bias said arm in a direction away from the other pulley, said biassing means applying a force to said arm at a point spaced from said pivot axis and the axis of rotation of the pulley mounted on said arm by distances proportional to the diameters of said first and second pulleys.

2. Apparatus for twisting a running yarn comprising a support structure, first and second pulleys mounted on said support structure for rotation about spaced, substantially parallel respective first and second axes and each having a periphery lying substantially in alignment with the periphery of the other pulley, an endless belt passing around said peripheries so as to provide two runs each of which is twisted through substantially 180° and crosses the other of said twisted runs to form a nip therewith as it passes between the peripheries of said first and second pulleys, guide means for guiding a running yarn between said twisted belt runs in the region of said nip, and means for driving a driven one of said pulleys in rotation comprising an endless machine drive belt and a spindle on which said driven pulley is mounted, a shaft rotatably mounted in said support structure, a wharve on said shaft whereby said wharve may be driven by contact with said machine drive belt, a first drive pulley on said shaft, a second drive pulley on said spindle and an endless apparatus drive belt passing around said first and second drive pulleys.

4,566,266

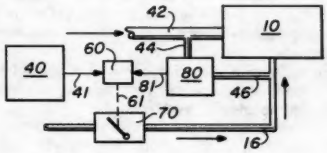
AUTOMATIC TEMPERATURE COMPENSATED FUEL FLOW REGULATION

Harry A. Kidd, Shinglehouse, Pa., and Thomas R. Edwards, Hinsdale, N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 13, 1984, Ser. No. 579,250

Int. Cl.⁴ F02C *3/22, 9/28*

U.S. Cl. 60—39.06 **23 Claims**



1. A method of achieving a desired fuel oxygen mass ratio in a gas turbine for an existing ambient air temperature comprising the steps of:

(a) determining a desired fuel/air differential pressure corresponding to the desired fuel/oxygen mass ratio for said gas turbine at any particular ambient air temperature;

(b) providing an adjustable fuel flow valve to regulate fuel flow to said gas turbine;

(c) generating a first electrical signal representing existing ambient air temperature;

(d) generating a second electrical signal from said first electrical signal representing a desired differential fuel/air pressure corresponding to the desired fuel/oxygen mass ratio for said existing ambient air temperature; and

(e) automatically adjusting said fuel valve in accordance with said second electrical signal to obtain the desired fuel/air differential pressure.

4,566,267

POWER GENERATING PLANT WITH AN INTEGRATED COAL GASIFICATION PLANT

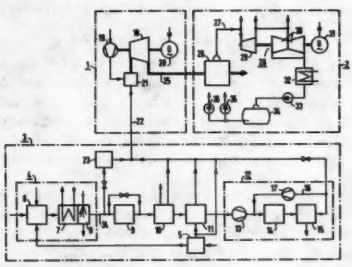
Rainer Müller, Erlangen, and Ulrich Schiffers, Eckental, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,330

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320228

Int. Cl.⁴ F02C *3/28*

U.S. Cl. 60—39.07 **4 Claims**



1. Power generating station with an integrated coal gasification plant and an ammonia synthesis plant comprising

(a) a coal gasification plant which includes a gasifier for gasification of coal to produce raw fuel gas containing a

mixture of gaseous constituents including H_2, CO, CO_2 and H_2S,

(b) a heat exchanger in which the heat of the raw gas from the gasifier is utilized to generate steam,

(c) a dust removal plant wherein the raw gas is treated to remove dust particles from the raw gas,

(d) a gas turbine power plant which include a gas turbine, a combustion chamber of the gas turbine, an air compressor for introduction of air into the combustion chamber, and a generator coupled to the turbine,

(e) a steam generating station which includes a steam generator, and a high pressure and low pressure steam turbine,

(f) conduit means for the passage of steam from the heat exchanger of the coal gasification to the steam turbine,

(g) connecting means for passage of part of the raw gas from the dust removal plant to the combustion chamber of the gas turbine,

(h) a conversion plant for converting part of the carbon monoxide in the raw gas from the dust removal plant into carbon dioxide and hydrogen,

(i) a subsequent gas purification plant to remove carbon dioxide and hydrogen sulfide impurities from the resultant raw gas from the conversion plant,

(j) a gas separation plant wherein the gas from the gas purification plant is treated to remove all other gases with the exception of hydrogen and, at the same time the hydrogen is enriched with nitrogen to form synthesis gas containing hydrogen and nitrogen suitable for conversion into ammonia and a separated fraction of residual gases,

(k) an air separation plant for separation of air into oxygen and nitrogen together with connecting means from the air separation plant to supply the coal gasifier with oxygen and the gas separation plant with nitrogen,

(l) an ammonia synthesis plant for the conversion of the synthesis gas containing hydrogen and nitrogen, having an ammonia synthesis reactor and separating means for separating ammonia from the residual gases in the reaction products from the synthesis reactor,

(m) connecting means for conduction of said synthesis gas into the ammonia synthesis reactor, and

(n) conduit means for passage of part of the residual gases in the reaction products from the ammonia synthesis reactor together with the separated fraction of residual gases in the gas purification plant to the combustion chamber of the gas turbine.

4,566,268

MULTIFUEL BURNER

Hans Hoffeins, Viernheim; Richard Kalbfuss, Mannheim, and Bora Ipek, Weinheim, all of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 10, 1984, Ser. No. 608,986

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317035

Int. Cl.[4] **F02C** *7/22;* **F23D** *13/36;* **F23R** *3/36*

U.S. Cl. 60—39.463 **6 Claims**

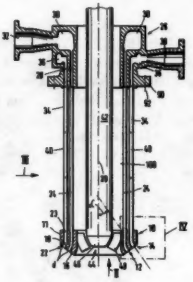
1. Multifuel burner having outlet locations for a plurality of fuels respectively connected with associated fuel feeding spaces arranged at a head of the burner, at least two of the fuel feeding spaces being for fuel gas and encompassing a plurality of outlet nozzles arranged annularly in a nozzle head, comprising:

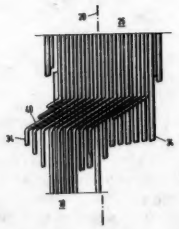
(a) a plurality of first tube conduits connecting respective ones of the outlet nozzles for fuel gas to one of the respective fuel feeding spaces associated therewith, and a plurality of second tube conduits connecting respective others of the outlet nozzles to the other of the respective fuel feeding spaces;

(b) the nozzle head having an annular shape and an outer edge formed with a chamfer inclined with respect to said longitudinal axis, the outlet nozzles having discharge openings extending perpendicularly through said chamfer and being inclined outwardly at an angle of 20° to 80° to said longitudinal axis;

(c) said first tube conduits extending rectilinearly and parallel to the longitudinal axis of the burner and being annularly disposed around said longitudinal axis;

(d) said second tube conduits being each formed with at least two changes in direction of the linear extension thereof in a manner that, starting from the nozzle head, said second tube conduits each extend initially rectilinearly and parallel to said longitudinal axis of the burner, then have a bend





therein at an angle of 20° to 80° with respect to said longitudinal axis, and then have a bend therein bringing them again into the direction of said longitudinal axis;

(e) the outlet nozzles as well as the respective first and second tube conduits as well as the one and the other fuel feeding spaces, respectively, being of such dimensions with respect to the cross sections and the numbers thereof that a nominal full capacity of the burner is attainable during operation with said ones and said others of the outlet nozzles, respectively.

4,566,269

JET ENGINE REMOVABLE SUPPORT ASSEMBLY

Richard E. Gingras, Agawam, Mass., assignor to United Technologies Corporation, Hartford, Conn.

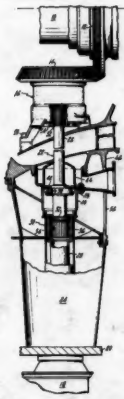
Filed Oct. 11, 1983, Ser. No. 540,935

Int. Cl.[4] **F02K** *3/04;* **F02C** *7/20*

U.S. Cl. 60—226.1 **6 Claims**

1. In a fan jet engine having a fan casing and an intermediate casing, a gearbox attached to said fan casing, a rotor drive shaft and a drive connection for the gearbox extending from the drive shaft through a portion of said fan casing, said drive connection including a tower shaft assembly comprising an upper tower shaft member and a lower tower shaft member, first gear means between said drive shaft and said upper tower shaft, first slideable connecting means between said first gear means and said upper tower shaft, second slideable connecting means between said upper and lower tower shafts, means surrounding said upper tower shaft and attached to said inter-

mediate casing for supporting and axially locating said upper tower shaft in a normal operating position, means for detaching said surrounding means from said intermediate casing so that said upper tower shaft can be moved axially to a first



position free of connection with said first gear means, and means for detaching said upper tower shaft from said surrounding means so that said upper tower shaft can be moved axially to a second position free of connection with said lower tower shaft.

4,566,270

GAS TURBINE ENGINE INFRA-RED RADIATION SUPPRESSOR

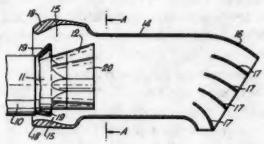
John R. Ballard, Sarratt; Peter H. Timmis, and Michael J. Buller, both of Kings Langley, all of England, assignors to Rolls-Royce Limited, London, England

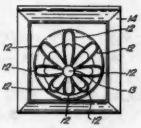
Continuation of Ser. No. 433,876, Oct. 13, 1982, abandoned. This application Nov. 14, 1984, Ser. No. 671,336

Claims priority, application United Kingdom, Nov. 3, 1981, 8133087

Int. Cl.⁴ F02C 7/18

U.S. Cl. 60—264 **5 Claims**





1. A gas turbine engine infra-red radiation suppressor comprising:

a circumferentially convoluted exhaust nozzle defining lobes and having a downstream end for discharge of an exhaust efflux;

a duct having an upstream end surrounding and extending upstream of said downstream end of said circumferentially convoluted exhaust nozzle, said duct extending downstream of said circumferentially convoluted exhaust nozzle and terminating in a downstream end, said upstream end of said duct being in spaced relationship to said circumferentially convoluted exhaust nozzle to define a gap for drawing of ambient air into said duct for rapid mixing with said exhaust efflux discharged from said circumferentially convoluted exhaust nozzle;

diffuser means positioned in said duct immediately adjacent the downstream end of said duct for diffusing said air and said exhaust efflux flowing from said duct, said diffuser means including a plurality of uncooled vanes extending across the downstream end of said duct, said vanes having upstream ends spaced a sufficient distance downstream of said downstream end of said convoluted exhaust nozzle to permit the rapid mixing of exhaust efflux from said exhaust nozzle and ambient air in said duct, said vanes further being arranged to prevent an axial direct line of sight of said circumferentially convoluted exhaust nozzle from said downstream end of said duct; and

means shielding a portion of said circumferentially convoluted exhaust nozzle from a direct line of sight through said gap between said circumferentially convoluted exhaust nozzle and said duct.

4,566,271

ENGINE SYSTEMS

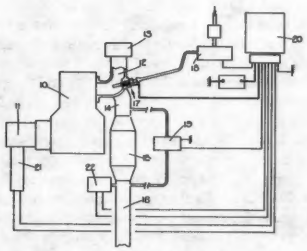
Geoffrey R. French, Weybridge; Pierre H. Peltret, Greenford, and Brian J. Chalke, Feltham, all of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Nov. 14, 1983, Ser. No. 551,175

Claims priority, application United Kingdom, Dec. 1, 1982, 8234212

Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—286 **1 Claim**



1. An engine system for a road vehicle comprising an internal combustion engine having an exhaust manifold connected to an exhaust system of the vehicle by way of a treatment device which acts to purify the exhaust gas leaving the engine, a heating device operative to cause an increase in the temperature within said treatment device said treatment device being self cleaning when the exhaust gas temperature is above a predetermined value, the system including a control system responsive to engine speed and vehicle speed and arranged to cause operation of said heating device when the vehicle speed is above a predetermined value and the engine speed is below a predetermined value such that the engine exhaust gas temperature is below said predetermined value, and when the engine speed has been below said predetermined value for a specified period.

4,566,272

HYDRAULIC CONTROL APPARATUS FOR A SERVO-MOTOR, PARTICULARLY FOR VEHICLE STEERING

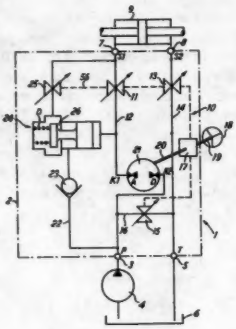
Hans C. Petersen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Dec. 8, 1983, Ser. No. 559,301

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248638

Int. Cl.[4] F01C *1/10*

U.S. Cl. 60—384 8 Claims



1. A hydrostatic steering control device, comprising, a housing having a plurality of ports including fluid inlet and outlet ports and two motor ports connectable to an external servomotor, said housing having first and second transversely extending end wall means and central wall means extending transversely between and in axially spaced relation to said end wall means, a metering motor having a casing rotatably mounted in said housing between said first and central wall means, said casing and one of said wall means forming directional switching valve means for controlling the direction of said servomotor by forming alternate supply and return paths via said fluid inlet and outlet ports and said motor ports, said directional valve means having first engaging valve surfaces therebetween forming a first set of adjustable throttling orifices, said metering motor having an outer member fixed relative to said casing and an inner member movable relative to and cooperable with said outer member to generate a metered fluid flow in said supply path corresponding to the movement of said inner member relative to said outer member, control shaft means for actuating one of said members, one of said metering motor member being connected to said directional valve means to rotate said directional valve means in either turning direction, resilient means for maintaining said directional valve means in a neutral position between two operating positions in the absence of a turning force on said shaft means, a bypass path in said housing between said fluid inlet port and either of said motor ports bypassing said directional valve means and said metering motor, rotary valve means in said bypass path between said housing central wall means and one of said housing end wall means, second engaging valve surfaces between said rotary valve means and one of said wall means forming a second set of adjustable throttling orifices in said bypass path, shaft means between one of said metering motor members and said rotary valve means for rotating said rotary valve means therewith and therby operate all of said adjustable throttling orifices in unison in response to turning of said control shaft means, and pressure regulating means in said bypass upstream of said second set of throttling orifices and responsive to pressure in said bypass and supply paths to maintain constant pressure drops across said throttling orifices in said bypass and supply paths.

4,566,273

PNEUMATIC SERVOMOTOR

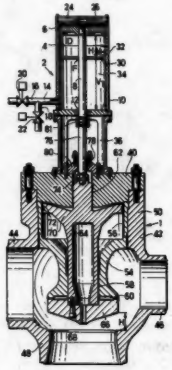
Markus Baumeler, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 11, 1983, Ser. No. 474,285

Claims priority, application Switzerland, Mar. 17, 1982, 1665/82

Int. Cl.[4] F15B *11/06*

U.S. Cl. 60—415 4 Claims



1. A pneumatic servomotor for a valve comprising

a cylinder having an inside diameter (D) and a pair of end faces;

a piston slidably mounted in said cylinder to move between a first position adjacent one end face of said cylinder and a second position spaced from said one end face;

a piston rod secured to said piston and extending through the other end face of said cylinder for connection to a valve outside said cylinder;

a partition in said cylinder to define a first chamber with said piston and a second chamber with said other end face of said cylinder, said second chamber having a volume larger than the volume of said first chamber;

a first control valve for controlling a flow of pressurized medium to said second chamber;

a second control valve for controlling a flow of medium from said second chamber;

said partition having an annular surface spaced about said piston rod to define a constriction communicating said first chamber with said second chamber to throttle a flow of pressurized medium from said second chamber into said first chamber, said constriction having a flow cross-sectional area (F_{id}) of not more than $F_{id}=0.02\ D^2$; and

an aperture communicating a third chamber between said piston and said one end face of said cylinder with a pressure medium sink.

4,566,274

CONTROL DEVICE FOR A HYDROSTATIC DRIVE

Joachim Heiser, Stuttgart, and Dieter Weigle, Urach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,415

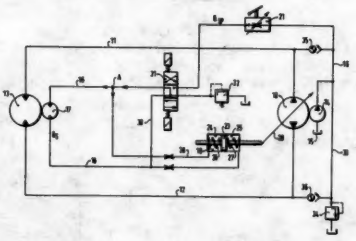
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236580

Int. Cl.[4] F16H *39/46*

U.S. Cl. 60—444 13 Claims

1. A control device for a hydrostatic drive having an adjustable pump, a pressure responsive setting cylinder coupled to said pump, a hydraulic motor connected via pressure conduits to said pump, and a measuring motor coupled to the hydraulic motor to rotate with a proportional rotary speed, the measur-

ing motor having an inlet and an outlet, the outlet being connected via a conduit to said setting cylinder, comprising a nominal flow generator connected via a conduit to the inlet of said measuring motor to produce an adjustable control flow which when attained by said measuring motor determines the desired rotary speed of said hydraulic motor; and means for



controlling flow difference between said nominal flow generator and said measuring motor, said controlling means being connected between the inlet and the outlet of said measuring motor to counteract pressure fluid supplied to said setting cylinder so as to keep adjusting said pump for so long as until the flow volume absorbed by said measuring motor equals the flow volume discharged from said nominal flow generator.

4,566,275

HYDRAULIC BOOSTERS FOR VEHICLE BRAKING SYSTEMS

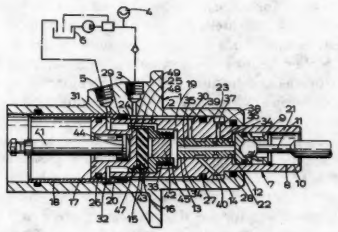
Glyn P. R. Farr, Leek Wooton, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Continuation of Ser. No. 391,354, Jun. 23, 1982, abandoned. This application Dec. 14, 1984, Ser. No. 881,696

Claims priority, application United Kingdom, Jul. 4, 1981, 8120750

Int. Cl.[4] B60T *13/20*

U.S. Cl. 60—554 **12 Claims**



1. An hydraulic booster for a vehicle braking system comprising a housing provided with a bore, an inlet for connection to a source of high pressure hydraulic fluid and an outlet for connection to a reservoir for fluid, a pedal operated input member, an output member for applying an output force to a master cylinder assembly, a boost piston working in said bore, a boost chamber in said bore, said boost piston being advanced in said bore in response to pressurisation of said boost chamber by fluid from said source, said boost piston having forward and rearward relatively movable parts, said forward and rearward parts carrying seals each having slidable sealing engagement with a complementary portion of said housing bore, said rearward part of said boost piston having a forwardly extending portion of a diameter less than the portions of said bore complementary with said forward and rearward seals, a seal assembly fixed in said housing intermediate said forward and rearward seals and having slidable sealing engagement with the forwardly extending portion of the rearward part of said boost piston, a pressure chamber connected at all times with said inlet and defined between said intermediate and rearward seals and the forwardly extending portion of the rear part of said piston, an exhaust chamber connected with said outlet and defined between said forward and rearward piston parts and said forward and intermediate seals, the rearward part of said boost piston having a bore therein, a recess between the relatively movable parts of said boost piston, said input member working in said bore in the rearward part of said boost piston, a reducer mechanism located in said recess, and thrust transmission means which in operation feeds a reaction load from said master cylinder assembly back to said input member through said forward piston part and said reducer mechanism to provide a reaction which is substantially unaffected directly by the magnitude of the pressure in said boost chamber.

4,566,276

INLET ASSEMBLY FOR A BRAKE MASTER CYLINDER

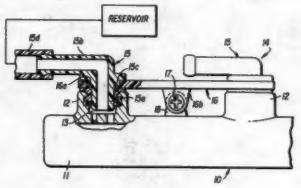
Junichi Komorizono, and Akihiko Miwa, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 13, 1984, Ser. No. 588,958

Claims priority, application Japan, Mar. 15, 1983, 58-38242[U]

Int. Cl.[4] F15B *7/00*

U.S. Cl. 60—585 **6 Claims**



1. A brake master cylinder having a reservoir, comprising:
a cylinder body having at least one inlet;
an inlet member mounted on said inlet of said cylinder body, said inlet member having at least one first member and a second member, said first and second members being formed of molded resin, respectively, and permanently interconnected with each other, said first member integrally forming a first tubular portion hermetically fitted into said inlet of said cylinder body and a second tubular portion connected to said first tubular portion, said second member having a mounting portion for mounting said inlet member on said cylinder body; and
a hose hermetically connected to said second tubular portion of said first member and in communication with said reservoir wherein said cylinder body further comprises a boss portion extending therefrom and within which said first tubular portion is mounted, said second member having a hole formed therein at one end thereof within which said first tubular portion is positioned such that said one end of said second member is positioned between said second tubular portion and said boss portion; and
means for positioning said second member above to a top portion of said boss portion.

2. A brake master cylinder having a reservoir, comprising:
a cylinder body having a pair of inlets;
an inlet member mounted on said pair of inlets of said cylinder body, said inlet member having a pair of first members and a second member, said pair of first members and said second member being formed of molded resin, respectfully, said second member permanently interconnecting said pair of first members, each of said first members integrally forming a first tubular portion hermetically fitted into a respective inlet of said cylinder body and a second tubular portion connected with said first tubular portion, and said second member having a mounting por-

tion for mounting said inlet member on said cylinder body; and

a pair of hoses hermetically connected to said second tubular portions, respectfully, of said first pair of member and in communication with said reservoir wherein said cylinder body further comprises a first and second boss portion extending therefrom and within which said first tubular portion of said pair of first members are respectfully positioned, said second member having a hole formed at opposite ends thereof and within which said pair of first members are respectively positioned such that said second member interconnects said pair of first members.

4,566,277

PRESSURIZED FLUID SUPPLYING ARRANGEMENT PARTICULARLY A MASTER CYLINDER OF A CLUTCH

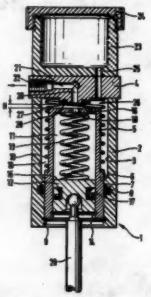
Alfred Birkenbach, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,208

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120272

Int. Cl.[4] B60T *11/26*; F15B *7/08*

U.S. Cl. 60—587 14 Claims



1. An arrangement for supplying pressurized fluid into a user circuit, particularly a master cylinder for supplying hydraulic fluid into a circuit leading to a slave cylinder of a clutch, in response to the application of an external force, especially a clutch pedal force, thereto, comprising

a cylinder housing defining a bore having an axis;

a cylinder sleeve sealingly accommodated in said bore for movement axially thereof between an inactive and an active position and bounding an external feeding compartment with said housing, and an internal pressure chamber;

a piston sealingly received in said pressure chamber for axial displacement relative to said sleeve and having an end face delimiting a pressure compartment in said pressure chamber;

means for applying the external force to said piston for displacing the same in said pressure chamber and for thus applying pressure to the fluid present in said pressure compartment;

a connecting port in one axial end of said cylinder sleeve remote from said piston for communicating said pressure compartment with said feeding compartment when said cylinder sleeve is in an inactive position, said connecting port being in communication with a supplying port for supplying fluid from said pressure chamber into the user circuit in the active position of said sleeve;

an auxiliary pressure port interconnecting said feeding compartment

with an auxiliary fluid reservoir for supply of fluid from said reservoir via said feeding compartment through said connecting port into said pressure chamber in the inactive position of said sleeve;

valve means on said sleeve and on said housing for respectively establishing and interrupting communication via said feeding compartment between said reservoir and said pressure chamber in said inactive and active positions of said sleeve; and

means for urging said sleeve toward said active position thereof in response to the displacement of said piston.

4,566,278

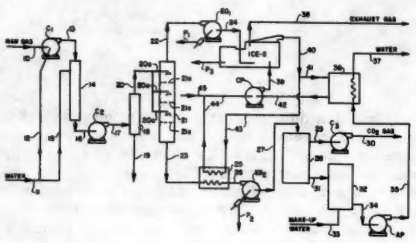
METHANE - CARBON DIOXIDE SCRUBBING METHOD AND SYSTEM

Louis W. Force, 718 North Dr., New Buffalo, Mich. 49117

Filed Oct. 29, 1984, Ser. No. 665,732

Int. Cl.[4] F01K *23/10*

U.S. Cl. 60—618 16 Claims



1. In the method of up-grading the heating value quality of digester generated methane gas by removing carbon dioxide gas therefrom and using the up-graded methane gas as fuel in an internal combustion engine - generator system to produce electric power, the steps comprising:

(a) mixing raw digester methane gas and cold water absorbent under relatively high pressure and introducing the cold gas-absorbant mixture to a contact tower to separate methane gas and other non-condensible gases from said raw digester gas and to condense the carbon dioxide component and other condensible gases of said raw digester gas for absorption by said water absorbant;

(b) removing the methane gas and other non-condensible gases from said contact tower as an overhead gas mixture of higher heating value quality, and utilizing said gas mixture as combustible fuel in the engine of an internal combustion engine - generator system to produce electric power;

(c) removing the water absorbent with absorbed condensed carbon dioxide and other condensed gases from said contact tower as a relatively high pressure bottoms absorbent - condensed gas stream, and heating and expanding said stream to reduce the pressure thereof and vaporize and release carbon dioxide gas and other absorbed gases from said absorbent;

(d) introducing water coolant to the cooling section of the engine of said engine - generator system to cool said engine with the attendant conversion of said coolant to saturated steam;

(e) removing said saturated steam from the cooling section of said engine;

(f) utilizing said steam in part to generate refrigeration to cool the water absorbent after the release therefrom of carbon dioxide gas and other absorbed gases and before the recycle of said absorbent as the cold water absorbent for mixing with raw digester methane gas and in part to heat the bottoms absorbent-condensed gas stream removed from said contact tower before said stream is expanded to release carbon dioxide gas and other absorbed gases therefrom, said utilization of said steam resulting in the cooling thereof to form water condensate; and

(g) recycling said water condensate to the cooling section of

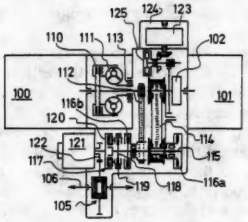
the engine of said engine - generator system as the water coolant for said engine.

4,566,279

VEHICLE PROPULSION PLANT

Sven O. Kronogard, deceased, late of Lomma, Sweden (by Allen Lindén, administrator); Clas O. Kronogard, Gråbo, and Hakan Kronogard, Lund, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Division of Ser. No. 302,626, Sep. 15, 1981, abandoned. This application Nov. 9, 1984, Ser. No. 669,892
Claims priority, application Sweden, Sep. 29, 1980, 8006805
Int. Cl.⁴ F02B 72/00
U.S. Cl. 60—718 6 Claims



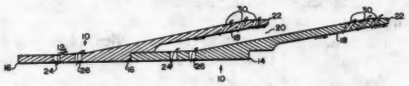
1. A vechicle propulsion plant comprising first and second internal combustion engine parts mounted end to end having crank shafts aligned and connectable to a propulsion shaft, a continuously variable belt transmission connectable to at least one of said internal combustion engines, and gear means mounted with its axes of rotation parallel to said crank shafts, for connecting said belt transmission to said vehicle propulsion shaft, and means interconnecting said engine parts with respect to at least one secondary operating fluid.

4,566,280

GAS TURBINE ENGINE COMBUSTOR SPLASH RING CONSTRUCTION

Donald N. Burr, 103 Woodfield Crossing, Glastonbury, Conn. 06033

Continuation-in-part of Ser. No. 477,903, Mar. 23, 1983, abandoned. This application May 15, 1984, Ser. No. 610,346
Int. Cl.⁴ F02C 7/00
U.S. Cl. 60—757 20 Claims



1. A combustor subassembly for a gas turbine engine, which comprises:

a plurality of modular elements;

each modular element being generally annular and extending from a first axial portion to a second axial portion, said second axial portion being flared inwardly toward the geometric center line of said modular element;

said modular elements being disposed in nested, substantially coaxial relationship with successive modular elements spaced axially along a substantially common center line;

a plurality of said adjacent modular elements having respective first and second axial portions disposed in overlapping relationship;

the overlapping of said modular elements defining annular flow passages for directing cooling air into said combustor;

each of a plurality of modular elements including holes therein in said first axial portion at an axial portion thereof which overlaps said second axial portion of another modular element; and

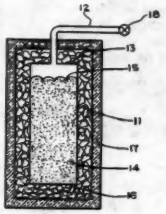
each of a plurality of said modular elements including holes therein in said second axial portion.

4,566,281

REACTION HEAT STORAGE METHOD FOR HYDRIDE TANKS

Gary D. Sandrock, Ringwood, N.J., and Edwin Snape, Suffern, N.Y., assignors to Ergenics, Inc., Wyckoff, N.J.

Filed Feb. 12, 1979, Ser. No. 11,194
Int. Cl.⁴ F17C 7/02, 11/00; F26B 5/04
U.S. Cl. 62—48 4 Claims



1. An absorption-desorption system comprising

a. hydridable material and hydrogen characterized by exothermicity during absorption and endothermicity during desorption; said hydridable material being confined in a containing means and said means including a conduit through which hydrogen as a gas is fed into said containing means at a specified feed pressure;

b. a heat storage medium in heat transfer connection with said hydridable material; and

c. a heat transfer barrier external said hydridable material and said heat storage medium

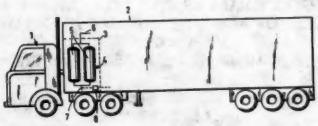
wherein the mass of said containing means, said hydridable material, and said heat storage medium is sufficient to absorb at least about 60% of the heat generated by absorbing the maximum capacity of said hydrogen in said hydridable material without the temperature of said hydridable material rising from an initial temperature to a temperature at which said hydridable material will have an equilibrium hydrogen pressure equal to said specified feed pressure.

4,566,282

METHOD AND APPARATUS FOR INERTING TRANSPORT CONTAINERS

Karl Knoblauch, Essen; Burkhard Harder, Oberhausen-Dellwig; Heinrich Heimbach, Essen-Heidhausen, all of Fed. Rep. of Germany, and Charles F. Cosentino, Wheaton, Ill., assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany and Nitrotec Corporation, New York, N.Y.

Filed Mar. 19, 1984, Ser. No. 591,401
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310012
Int. Cl.⁴ F17C 11/00
U.S. Cl. 62—48 9 Claims



1. A method of inerting transport containers comprising the steps of

inerting transport containers with a gas which contains nitrogen and a predetermined concentration of up to about 5 vol. % oxygen in a cyclic pressure-change adsorption process comprising from time to time

adsorbing oxygen in air on an adsorbent by conducting the air through a layer of the absorbent in which the oxygen in the air is adsorbed on the adsorbent at a pressure above atmospheric pressure and conducting a nitrogen-rich gaseous mixture still containing oxygen which discharges at the end of the layer of adsorbent into the transport container to be inerted,

desorbing the adsorbed oxygen from the air from the adsorbent by reduction of the pressure and,

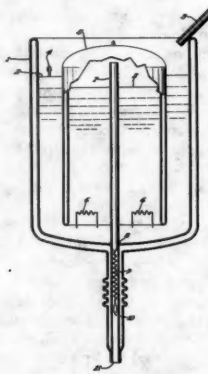
starting a next adsorption step comprising a first inerting phase with a multiple of predetermined amount of air necessary to maintain a desired oxygen concentration flowing through the layer of adsorbent and a second inerting phase with one time said amount of air flowing through the layer of adsorbent.

4,566,283

LOW TEMPERATURE DEVICE FOR COOLING SMALL SAMPLES

Roland Boese, Essen, Fed. Rep. of Germany, assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Aug. 30, 1984, Ser. No. 646,561
Int. Cl.[4] F17C *13/02*
U.S. Cl. 62—49 **4 Claims**



1. A device for providing a low temperature gas stream for cooling small samples undergoing spectroscopic analysis comprising:

insulated outer container means for containing liquified gas;

hood means within the outer container means for trapping evaporated liquified gas;

means within said hood means for evaporating liquified gas therein; and

tube means extending from the evaporated liquified gas trapped within said hood means through said outer container means.

4,566,284

METHOD AND APPARATUS TO UPGRADE THE CAPACITY OF AMBIENT-AIR LIQUID CRYOGEN VAPORIZERS

Barry L. Werley, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 25, 1985, Ser. No. 715,430
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—52 **5 Claims**

1. In a process for vaporizing a cryogenic fluid in an ambient-air vaporizer having at least twelve vertically disposed pipe lengths containing longitudinally placed heat exchange fins, said adjacent pipe lengths being approximately equally spaced from one another in a generally rectangular array with one side of the rectangle having four pipe lengths and the adjacent side having three pipe lengths, the improvement for upgrading the capacity of the vaporizer by minimizing ice build-up near the warmer pipe lengths which comprises:

(a) initially passing the cryogenic fluid to be vaporized through a first vertical pipe length located at one corner of the rectangle;

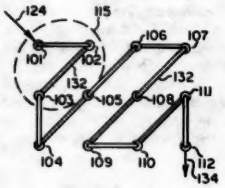
(b) removing the fluid from the first vertical pipe length and passing it through a second vertical pipe length located next to the first pipe length;

(c) removing the fluid from the second vertical pipe length and passing it through a third vertical pipe length located diagonal to the second pipe length and next to the first pipe length;

(d) removing said fluid from the third vertical pipe length and passing it through a fourth vertical pipe length located beside the third pipe length, and farthest from the first pipe length;

(e) removing the fluid from the fourth vertical pipe length and passing it through a fifth vertical pipe length located diagonal to the fourth pipe length and beside both the second and third pipe lengths;

(f) removing said fluid from the fifth vertical pipe length and



passing it through a sixth vertical pipe length located diagonal to the fifth pipe length and beside the second pipe length;

(g) removing said fluid from the sixth vertical pipe length and passing it through a seventh vertical pipe length located beside said sixth pipe length;

(h) removing said fluid from the seventh vertical pipe length and passing it through an eighth vertical pipe length located diagonal to the seventh vertical pipe length and beside said fifth pipe length;

(i) removing said fluid from the eighth vertical pipe length and passing it through a ninth vertical pipe length located diagonal to the eighth pipe length and beside said fourth pipe length;

(j) removing said fluid from the ninth vertical pipe length and passing it through a tenth vertical pipe length located beside the eighth and ninth pipe lengths;

(k) removing said fluid from the tenth vertical pipe length and passing it through an eleventh vertical pipe length located diagonal to the tenth pipe length and beside the seventh and eighth pipe lengths;

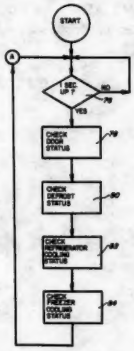
(l) removing said fluid from the eleventh vertical pipe length and passing it through a twelfth vertical pipe length located at a corner of the rectangle beside the tenth and eleventh pipe lengths; and

(m) removing said vaporized fluid from said twelfth vertical pipe length.

4,566,285
REFRIGERATOR DOOR AJAR ALARM WITH VARIABLE DELAY

Andrew T. Tershak, Center Township, Vanderburgh County, Ind., and Michael D. Thieneman, Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 26, 1984, Ser. No. 574,135
Int. Cl.[4] G01K *13/00*; F25B *49/00*
U.S. Cl. 62—129 **18 Claims**



1. In a refrigeration apparatus having means defining a refrigerated compartment and a door for providing access to said compartment, an improved door ajar alarm comprising:

means for sensing when said door is open;

means for sensing an operating condition of said refrigeration apparatus other than the position of said door;

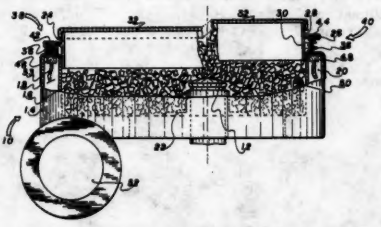
means for providing an alarm; and

control means coupled to said door sensing means, said condition sensing means and said alarm means for actuating said alarm means in response to said door being open for a period of time which varies in accordance with the sensed operating condition of the refrigeration apparatus.

4,566,286
AUTOMATIC ICE HOPPER

Paul Keller, 1004 94th Ave., NW., Coon Rapids, Minn. 55433

Filed Apr. 27, 1984, Ser. No. 604,582
Int. Cl.[4] F25C *5/18*
U.S. Cl. 62—135 **20 Claims**



1. An automatic hopper for an ice-making machine, comprising:

a container for receiving and storing pieces of ice from an ice-making mechanism, said container having substantially vertical walls and an open top bordered by said walls, said open top being as wide as said container,

means for conveying said pieces of ice into said container from said ice-making mechanism,

cover means for covering said container, said cover means comprising a rigid member which is as wide as said container and which covers the entire open top of said container,

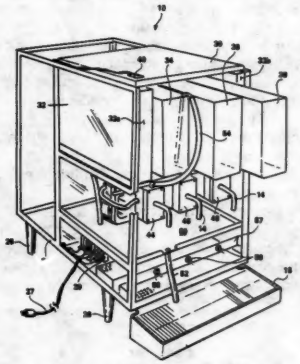
said cover means being loosely fitted onto the top of said container and arranged such that when ice which is conveyed into said container builds up in any part of said container to a level above the level of said cover means, said ice will push said cover means up and away from said container,

control means for controlling the operation of said ice-making mechanism, said control means being positioned such that when said cover means moves up and away from said container in response to the buildup of ice in any part of said container, said control means will switch off said ice-making mechanism.

4,566,287
POST MIX DISPENSING MACHINE

Richard J. Schmidt, 695 Trinity Ct., Longwood, Fla. 32750; Ronald R. Schmidt, 1416 Hartley Ave., Deltona, Fla. 32725; Walter E. Schmidt, 4 Stonegate N., Longwood, Fla. 32779, and Patrick J. Schmidt, 1710 Twin Oaks St., Deltona, Fla. 32725

Filed Dec. 5, 1983, Ser. No. 558,294
Int. Cl.[4] F25D *17/02*; B67D *5/56*
U.S. Cl. 62—188 **32 Claims**

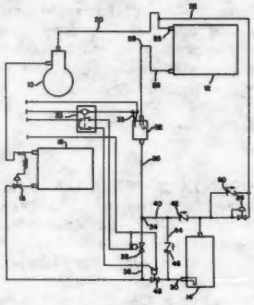


1. A machine for dispensing a freshly mixed cup of juice or other beverage made from concentrate mixed with water immediately prior to the dispensing, comprising a water reservoir, means attached to a water source for keeping an approximately constant head of water in said reservoir at all times, refrigeration coils disposed in the interior of said reservoir, and connected to means for causing the circulation of refrigerant through said coils, thus to chill the water to a temperature above the freezing point, at least one concentrate tank disposed closely adjacent said reservoir, with said refrigeration coils serving to keep the concentrate chilled, an electric pump connected to deliver concentrate from said concentrate tank to a mixing chamber, said pump having operator controlled actuating means, such that an operator can selectively cause a controllable quantity of concentrate to be delivered to said mixing chamber, water connection means from said reservoir to said mixing chamber, a power driven impeller located in said mixing chamber, with said impeller serving to mix such concentrate with a suitable quantity of water from said reservoir, adjustment means enabling the amounts of water and concentrate to be altered slightly from time to time as may be necessary to assure a selected ratio of these ingredients being maintained, and outlet means connected to said mixing chamber so that the properly mixed beverage can be dispensed into a cup or other drinking receptacle.

4,566,288
ENERGY SAVING HEAD PRESSURE CONTROL SYSTEM

Andrew W. O'Neal, 18517 8th Ave. NE., Seattle, Wash. 98155

Filed Aug. 9, 1984, Ser. No. 640,022
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—196.1 33 Claims



1. A refrigeration system including a closed refrigerant loop having a condenser, a receiver, an expansion device, an evaporator, and an air cooled compressor, further comprising:

(a) means for automatically maintaining adequate head pressure of the system during colder weather, including means for backflooding the condenser or shuttling liquid refrigerant from the receiver to the condenser to maintain a desired head pressure;

(b) reservoir means for accumulating liquid refrigerant flowing between the condenser and the receiver;

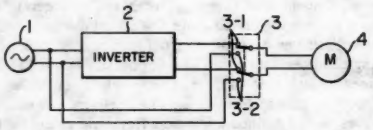
(c) sensor means for sensing the level of liquid refrigerant of the reservoir means; and

(d) diverting means for diverting subcooled liquid refrigerant from the condenser directly to the expansion device, thereby bypassing the receiver, the diverting means being responsive to the sensor means indicating a level of liquid refrigerant of the reservoir means above a predetermined level.

4,566,289
REFRIGERATOR CONTROL SYSTEM

Kenichi Iizuka, Ashikaga; Hideo Uzuhashi, Tochigi; Yoshihisa Uneyama, Tochigi; Michiya Matuda, Tochigi, and Minoru Kobayashi, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,800
Claims priority, application Japan, Nov. 16, 1983, 58-213962; Mar. 12, 1984, 59-45415
Int. Cl.[4] F25B *1/00*; H02P *5/28*
U.S. Cl. 62—228.4 6 Claims

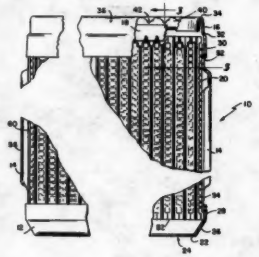


1. A control system for a refrigerator including a compressor for making up a freezing cycle and a motor driven by a commercial power supply for driving said compressor, said control system comprising an inverter circuit connected to said commercial power supply, a power switch connected to said commercial power supply, switching means connected to said motor and switchable between a first mode where said motor is connected to said commercial power supply through said inverter and a second mode where said motor is connected to commercial power supply through said power switch, and control means responsive to a predetermined external signal applied thereto for producing a control signal for turning off said power switch and then switching said switching means from said second mode to said first mode.

4,566,290
CAPILLARY FIN MEDIA

Roy T. Otterbein, Phoenix, Ariz., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Mar. 28, 1983, Ser. No. 479,127
Int. Cl.[4] B01F *3/04*; F28D *5/00*
U.S. Cl. 62—304 5 Claims

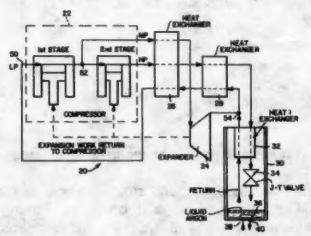


1. A generally plate-like structure for use as a media element in a wetted surface air-to-air heat exchanger comprising a water-impervious sheet for separating a first stream of cooling air and water from a second stream of air to be cooled, said sheet formed to have a plurality of fins having an outer surface extending outwardly into the second stream of air, each fin formed to contain a slot-like depression defining an inner surface of the fin generally similar to the outer surface of the fin, the depression being dimensioned thin enough to exhibit capillarity for drawing water from the first stream into the depression, and thick enough to exhibit good heat transfer characteristics when filled with water.

4,566,291
CLOSED CYCLE CRYOGENIC COOLING APPARATUS

Richard A. Halavais, Pompton Lakes, N.J., assignor to General Pneumatics Corporation, Orange, N.J.

Continuation of Ser. No. 466,016, Feb. 14, 1983, abandoned.
This application Oct. 15, 1984, Ser. No. 660,549
Int. Cl.[4] F25D *9/00*
U.S. Cl. 62—402 37 Claims



1. Cooling apparatus comprising compressor means for compressing a gas, expander means for enabling expansion of a portion of the compressed gas and for enabling the expansion of the compressed gas to perform work, and fluid means con-

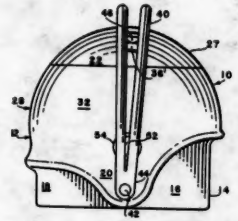
necting the expander means and the compressor means for applying said work of expansion to the compressor means to assist the compressor means in said compressing, wherein the compressor means is a diaphragm compressor comprising a housing having a cavity with a resilient diaphragm disposed therein, the diaphragm being displaceable by the fluid means for compressing gas within the cavity, wherein the fluid means comprises a fluid reservoir partially formed by a movable member, and fluid passageway means connecting the fluid reservoir to a first side of the diaphragm, and wherein the expander means comprises a portion of the movable member disposed within an expansion chamber in the housing, the movable member being movable in a direction to increase the volume of the expansion chamber while simultaneously decreasing the volume of the fluid reservoir so as to cause fluid in the reservoir to exert pressure against the diaphragm and to displace the diaphragm in a direction to compress gas within the cavity.

4,566,292

HELMET COOLER

Lawrence S. Parmet, 4358 Inveraray Walk, Roswell, Ga. 30075

Filed Nov. 5, 1984, Ser. No. 668,569
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **10 Claims**



1. In a helmet cooler which looks like a football or other helmet:

a helmet cooler housing,

a movable helmet top closure member on said housing,

a container space inside said cooler wherein a plurality of soft drink cans may be placed together with crushed ice,

a face mask pivotally mounted on pivots on opposite sides of said housing and being movable from a position extending in front of said housing corresponding to where the face would be in a football helmet to a position extending upwardly over said closure on said housing, to provide a handle, and

latch means between said face mask in handle position and said closure member.

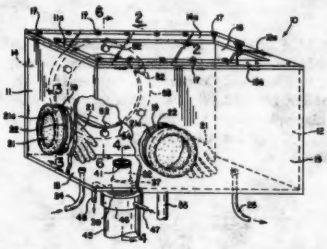
4,566,293

METHOD OF SAMPLE PREPARATION AND APPARATUS THEREFOR

Russell E. Arner, Brunswick; Ronald J. Emrich, Shaker Heights; James Gianelos, Lyndhurst, and Marlon L. Haynes, Stow, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 3, 1984, Ser. No. 677,252
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R **4 Claims**

1. A freeze box capable of being hermetically sealed and suitable for use in association with a surface analysis instrument, said freeze box comprising air-impervious side wall panels, a front wall panel, a back wall panel, a floor panel and a cover panel, at least one of said panels containing an air-impervious transparent segment to permit an operator to view into the interior of said freeze box when said freeze box is in operation, said freeze box having at least two outwardly protruding hollow, generally cylindrical glove mounting rings extending through openings in the walls of said freeze box and communicating with the interior of said freeze box at one end and with the ambient atmosphere at the other end, an air-impervious glove with a cuff portion associated with each said glove mounting ring, said cuff portion of said glove being disposed over the exterior outwardly protruding cylindrical surface of the said glove mounting ring with which it is associated, means for clamping said cuff portion of said glove to said exterior cylindrical surface of said glove mounting ring with which it is associated to form a hermetic seal between said cuff portion of said glove and said glove mounting ring, means in



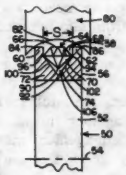
said floor panel adjacent on said side wall for introducing an inert purging gas into the interior of said freeze box, means adjacent the other said side wall for allowing the escape of purging gas from the interior of said freeze box, cooling means extending through said floor panel, said cooling means having a freeze rod provided with means for associating a sample to be cooled therewith, said cooling means having means for cooling said freeze rod to temperatures below −110° C., and said freeze box with a surface analysis instrument, said freeze box having an opening to permit a sample cooled in said freeze box to be transferred into the surface analysis instrument.

4,566,294

METHOD FOR THE MOUNTING OF GEMS AND RESULTING PRODUCT

Jan Brzozowski, 150 E. 69th St., New York, N.Y. 10021

Filed Feb. 2, 1984, Ser. No. 576,214
Int. Cl.[4] A44C *9/0, 17/02*
U.S. Cl. 63—15 **15 Claims**



1. A method for the mounting of gems, said method comprising forming a groove in a metallic support with rims upstanding on opposite sides of the groove, arranging the gems in a row in said groove, and deforming the rims to peripherally overlap the gems in the groove, the gems having apices, said apices being spaced above the bottom of the groove, the gems having girdles, the girdles of adjacent gems in said row abutting each other, the groove being formed with a symmetrical generally V-shaped base against which the girdles are forced during the deforming step, the gems having pavilions of generally similar angles and the V-shaped base being formed with a smaller angle, the rims prior to the deforming step being spaced apart at a distance which is at least as great as the size of the gems at the girdles thereof.

15. A ring comprising a toroidal body of precious metal

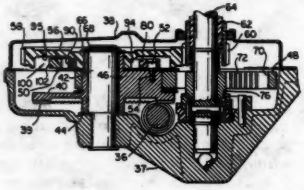
provided with a peripheral annular groove of substantially uniform cross-section having a symmetrical V-shaped base, gems, all of said gems including girdles and pavilions of substantially similar angles, said gems being mounted in said groove with the pavilions extending towards said base, the gems having apices spaced above the bottom of said base, the base being of an angle smaller than that of said pavilions, the girdles resting against said base, and rims on said body on opposite sides of said groove and clamping the gems in said groove, the gems being positioned adjacent to one another in a row with said girdles of adjacent gems in abutting relationship.

4,566,295

NEUTRAL PUMP-OUT FOR AUTOMATIC WASHER

Anthony Mason, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 452,285, Dec. 22, 1982, Pat. No. 4,491,210.
This application Sep. 4, 1984, Ser. No. 630,871
Int. Cl.[4] D06F 37/40
U.S. Cl. 68—12 R **5 Claims**



1. In an automatic laundry appliance, including
a tub for receiving wash liquid,
a receptacle within said tub for receiving a clothes load,
a motor selectively coupled to a first drive means in a first direction of rotation for agitating a clothes load and in a second direction of rotation to a second drive means for spinning said receptacle containing said clothes load,
a pump means driven by said motor for removing said wash liquid from said tub,
a presettable sequential control means for controlling a cycle of operation including a period when said first drive means is decoupled followed by a period when said second means is coupled to said motor,
a delay means for delaying coupling of said second drive means until said pump means has removed a quantity of said wash liquid from said tub, said delay means comprising:
an automatically actuatable rotating engagement means for drivingly engaging said second drive means; and
an automatically actuable latch means preventing engagement of said engagement means with said second drive means after said engagement means has been automatically actuated by rotation of said motor in said second direction until said control means interrupts said motor operation in said second direction.

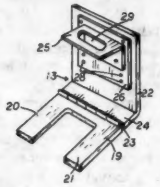
4,566,296

PADLOCK SECURITY COVER

Donald G. Kochakis, 95 E. Prospect St., Chula Vista, Calif. 92011

Filed Aug. 6, 1984, Ser. No. 633,059
Int. Cl.[4] E05B 67/38
U.S. Cl. 70—56 **8 Claims**

1. In cooperation with a padlock having a shackle engaging at least one eye of a lock or link of a chain for securing a door, gate or the like, a cover comprising:
a first plate shaped and dimensioned for mounting against the door, or gate;
a second plate hinged to the forward edge of the first plate for pivoting between an open position and a closed position generally parallel to and distal from said first plate and covering at least the shackle of the padlock;



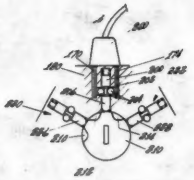
said second plate including an eye member projecting from its inner face proximally to said eye or link in said closed position for locking engagement with said padlock shackle.

4,566,297

ELECTRICAL PLUG LOCKING DEVICE

Robert C. Hawley, 3079 Calle Pinon, Santa Barbara, Calif. 93105

Filed Jul. 22, 1983, Ser. No. 516,701
Int. Cl.[4] E05B 65/00; H01R 4/54
U.S. Cl. 70—57 **20 Claims**



1. A locking device for use with an electrical plug having at least one tine having an aperture located at a selected end thereof, said locking device comprising
a housing having at least one opening therein which is adapted to position the selected end of a said tine at predetermined location along a predetermined path;
at least one releasable locking means located within said housing adjacent to the opening, said at least one releasable locking means including
an elongated member having a first end section and a second end section and a circumferentially extending continuous slot formed around the periphery thereof between said first end section and said second end section, said slot having a goemetrical dimension which is smaller than the geometrical dimension of the outer surface of said elongated member, said elongated member being slideably mounted within said housing for linear movement relative to said predetermined path between a first position wherein said slot is remote from the predetermined location and a second position wherein said slot is located along the predetermined path and positioned substantially in alignment with the aperture of a said selected tine located at said predetermined location; and
at least one spherical member having a diameter which is substantially equal to the distance between the outer surface of said elongated member and the location where a tine is adapted to be positioned within said opening, said at least one spherical member being adapted to be positioned in said housing and between said outer surface of said elongated member and the location of an aperture of said tine adapted to be positioned within said opening for applying a locking force between said outer surface of said elongated member and a said tine adapted to be positioned in said opening and being adapted to urge the spherical member into the aperture of and locking a said tine

adapted to be positioned in the opening when said elongated member is in said first position, said at least one spherical member being adapted to be moved away from the aperture in a said tine adapted to be positioned in said opening when the same is located in said predetermined location and into said slot when said elongated member is in said second position enabling the tine adapted to be positioned in said opening to be free of the locking force of said spherical member in said aperture of said tine adapted to be positioned in said opening enabling the same to be removed from said housing opening.

4,566,298

PROFILE EXTRUDER INCLUDING PULL MEASURING MEANS

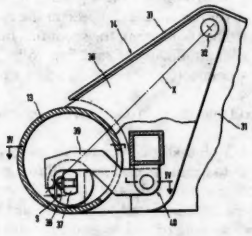
Friedrich W. Elhaus, Dorfstrasse 21, D-7761 Moos, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,177

Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316161

Int. Cl.[4] B21C *35/01, 51/00*

U.S. Cl. 72—6 5 Claims



1. Apparatus for measuring the pull force applied by a puller head to an extrusion profile as it is extruded out of an extruder along a runout conveyor (1), comprising

(a) carriage means (4) mounted for displacement along the runout conveyor by controllable drive means (9);

(b) puller head means (14) including gripper head means (15,18) for gripping an extruded profile;

(c) means including a cantilever arm (13) connecting said puller head means with said carriage means for displacement between operable and retracted positions relative to said runout conveyor;

(d) said puller head means including a pair of relatively displaceable members (30,31) a first one (30) of which is connected with said cantilever arm and a second one (31) of which carries the profile gripping means, said second member (31) being movably connected to said first member; and

(e) force detecting means connected between said first and second puller head members for supplying a pull responsive control signal to said drive means, comprising

(1) a force detector (34) connected with one of said puller head members; and

(2) a tension member (39) connected with the other of said puller head members for transmitting the pull force to said force detector.

4,566,299

CONTROL METHOD AND APPARATUS FOR ROLLING MILL

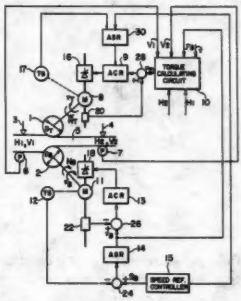
Hiroshi Koyama, Hitachi, and Keiji Saito, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,592

Claims priority, application Japan, Jun. 29, 1983, 58-115908

Int. Cl.[4] B21B *37/00*

U.S. Cl. 72—8 6 Claims



1. A control apparatus for controlling at least a pair of rolls of a rolling mill for rolling a material to be rolled by passing said material through a pressure gap defined between said rolls, said apparatus comprising:

a pair of motors connected to respective work rolls;

speed control means connected to one of said motors and controlling the speed of said one of said motors driving one of said rolls so as to drive said one roll at a predetermind peripheral speed;

first means connected to said one roll for determining and outputting a signal representing an actual torque produced by said one roll;

second means for determining and outputting a signal representing a total torque required for rolling said material under a predetermined rolling condition;

third means connected to the output of said first and second means for producing a torque signal representing a difference between said total torque determined by said second means and said actual torque of said one roll determined by said first means; and

fourth means connected to said third means and said other roll for controlling a current of the other of said motors for driving said other roll so as to cause said other roll to produce a torque corresponding to said torque signal.

4,566,300

METHOD FOR THE MANUFACTURE OF A CONICAL TUBULAR MEMBER

Sven R. V. Gebelius, Drottningholmsvägen 195, Bromma, Sweden (S-161 36)

PCT No. PCT/SE83/00110, § 371 Date Oct. 27, 1983, § 102(e) Date Oct. 27, 1983, PCT Pub. No. WO83/03374, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 25, 1983, Ser. No. 557,139

Claims priority, application Sweden, Mar. 26, 1982, 8201959

Int. Cl.[4] B21D *15/03*

U.S. Cl. 72—63 9 Claims

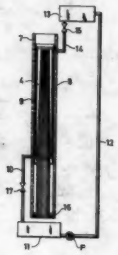
1. A method for the manufacture of a conical tubular member comprising:

forming a tubular member having a substantially non-tapered configuration along its length and at least one profiled groove extending longitudinally along the length of the tubular member and inwardly with respect to the surface thereof;

placing said tubular member in at least partial surrounding

relationship onto a conical mandrel having at least one groove in the outer surface extending along the length thereof corresponding to said profiled groove in said tubular member to receive said profiled groove therein;

maintaining said tubular member in substantially fixed position on said mandrel; and



applying a fluid pressure force to the exterior of said tubular member to compress said tubular member onto said mandrel and said at least one profiled groove into said at least one groove in the mandrel to conform said tubular member to the conical shape of said mandrel by changing the cross-section of said at least one profiled groove as it is pressed into said at least one groove in the mandrel.

4,566,301

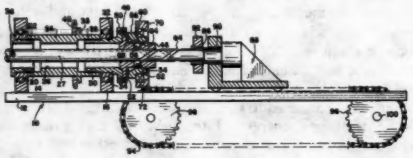
METHOD AND MEANS OF MANUFACTURING SPIRALLY FLUTED TUBES

Donald E. O'Dell, Tulsa, Okla., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Continuation of Ser. No. 415,163, Sep. 7, 1982, abandoned. This application Dec. 13, 1984, Ser. No. 681,005

Int. Cl.[4] B21D *15/04*

U.S. Cl. 72—75 **10 Claims**



1. A method of forming spirally-fluted tubing which comprises moving a tube longitudinally through a rotatable forming die, applying the formable pressure against the outer periphery of the tube during movement of the tube through the rotating forming die, and varying the pressure applied against the outer periphery of the tube during the forming operation without interruption thereof and as required for controlling the depth of deformation during the spiral fluting operation, wherein the forming die comprises sleeve means having a plurality of circumferentially spaced bores and ball means disposed within said bores, and cylindrical chuck means having a central passageway therethrough and disposed in surrounding relation to said sleeve means, said passageway having an outwardly flared surface adapted to engage said ball means for applying tube deforming pressure thereto and including the step of selectively-moving said cylindrical chuck means relative to said ball means during movement of said tube through said forming die so that differential portions of said surface will engage said ball means to modify the pressure thereon, so that the depth of deformation will be modified.

4,566,302

TREATMENT PRIOR TO DISPOSAL OF A SHEATHING TUBE OF A SPENT FUEL BOX OF A NUCLEAR REACTOR FUEL ASSEMBLY

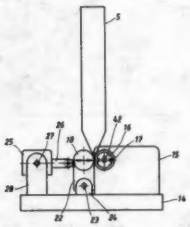
Antti Suvanto, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Nov. 12, 1982, Ser. No. 440,945

Claims priority, application Sweden, Sep. 20, 1982, 8205362

Int. Cl.[4] B21C *47/14*

U.S. Cl. 72—146 **4 Claims**



1. An apparatus for flattening a tubular member which contains a spent fuel box of a nuclear fuel assembly, said tubular member including a lower end which includes a bead, said apparatus being usable beneath the surface of a tank of radiation-protecting water, said apparatus comprising

a base plate,

a first roll fixedly mounted in cantilever fashion on said base plate, said first roll including a groove in its circumferential surface for containing the bead at the lower end of the tubular member containing the spent fuel box, said groove extending longitudinally of said first roll,

drive means connected to said first roll to rotate said first roll,

a second roll mounted in cantilever fashion on said base plate,

support means pivotally connected at its lower end to said second roll to enable said second roll to move toward and away from said first roll, and

adjustment means connected to said support means to control the positioning of said second roll with respect to said first roll.

4,566,303

EXTRUSION MACHINERY

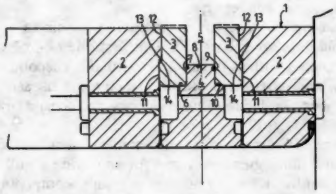
Owen P. McKenna, London, England, assignor to BICC Public Limited Company, London, England

Filed Jun. 13, 1984, Ser. No. 620,372

Claims priority, application United Kingdom, Jun. 23, 1983, 8317072

Int. Cl.[4] B21C *23/00*; B21D *37/16*

U.S. Cl. 72—262 **5 Claims**



1. Conform machinery for continuous friction-effected extrusion having a wheel comprising:

two cheek members;

a central hub;

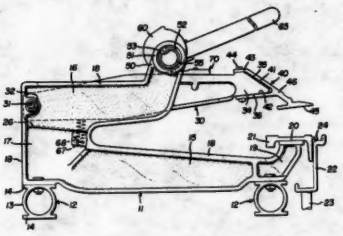
two separate ring members each located between said central hub and a respective said cheek, said rings having external diameters larger than said central hub so that a working passageway is formed with said central hub and each said ring defining a wall thereof;

abutting slip surfaces on said cheek members and said rings, said abutting slip surface on each cheek member being in driving engagement with said abutting slip surface on the corresponding ring, said abutting slip surface on each cheek member having at least one annular surface facing inwardly toward an axis of the wheel and said abutting slip surface of each ring having at least one annular surface facing outwardly away from the axis of the wheel and disposed radially inwardly from the at least one annular surface of the corresponding cheek member, thereby to allow relative thermal radial expansion of said rings with respect to said cheek members until said annular surfaces engage one another, said radial expansion at any particular place on the circumference of said rings being limited to a distance less than the relative expansion in the diameter of the rings between ambient temperature and the expected working conditions of the machine.

4,566,304
SHEET METAL BENDING BRAKE

Van Cleave, Eugene H., Orchard Lake, and Douglas G. Break, Farmington Hills, both of Mich., assignors to Van Mark Products Corporation, Farmington Hills, Mich.

Filed Jan. 18, 1983, Ser. No. 458,958
Int. Cl.⁴ B21D *5/04*
U.S. Cl. 72—319 **5 Claims**

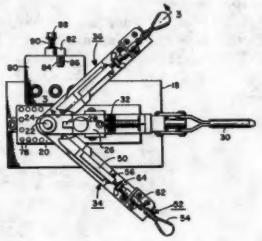


1. In a sheet metal bending brake having at least two laterally spaced prime support elements and frame means fixedly securing said elements in assembly, each element including (a) a lower arm portion terminating in a horizontal support surface for a sheet metal workpiece and a hinged bending leaf underlying said workpiece, and (b) an upper arm portion terminating short of said horizontal support surface; the improvements of a clamping arm for each prime support element with each arm having one end pivotally secured to said prime support element and its other end projecting toward said horizontal support surface, means on said other end of each clamping arm overlying said horizontal support surface and cooperable therewith for clamping a workpiece therebetween, a rotatable shaft bridging said prime support elements and journalled in the upper arm portions thereof, respectively, cams corotatably secured to said shaft, one cam being aligned with each of said clamping arms, a cam contact plate carried by each clamping arm and having a tapered extension interposed between the associated arm and cam, respectively, and means for slidably and individually adjusting each of said cam contact plates along the associated arm to vary the thickness of the extension interposed between the respective arms and the overlying cams, thereby varying the extent of arm actuation upon rotation of the associated cam.

4,566,305
SWEEP-ARM BENDER FOR FORMING ORTHODONTIC ARCHES

Arthur L. Wool, 1402 Penn Ave., Wyomissing, Pa. 19610

Filed May 11, 1984, Ser. No. 609,288
Int. Cl.⁴ B21D *11/04*
U.S. Cl. 72—321 **10 Claims**



1. A sweep-arm bender for forming orthodontic arches from straight wire blanks comprising:

a die having a cylindrical surface and a wire-receiving groove in said surface, the groove being situated in a plane perpendicular to a die axis about which the cylindrical surface is symmetrical;

clamping means, connected to the die and movable toward and away from said cylindrical surface, for temporarily engaging a wire blank and applying a clamping force to the wire blank, thereby firmly holding a portion of the wire blank in the groove of the die;

first and second sweep arms, each pivoted on said die axis;

a slide on each of said sweep arms, and guide means on each of said arms constraining its slide to movement toward and away from said die axis;

bearing means on each slide and a circular cylindrical roller carried by each slide, each roller being mounted in the bearing means on its slide for rotation about a roller axis which is parallel to the die axis, and each roller being positioned so that it is intersected by said plane in which the wire-receiving groove is situated; and

means on each arm for temporarily locking its roller in a position such that the outer roller surface is capable of pressing the wire blank into the wire-receiving groove as the arm sweeps about the die axis;

each of the arms being pivotable from a position in which its roller is located adjacent to the clamping means to a position beyond the position in which its roller is directly opposite the clamping means.

9. A sweep-arm bender for forming orthodontic arches from straight wire blanks comprising:

a die having a cylindrical surface and a wire-receiving groove in said surface, the groove being situated in a plane perpendicular to a die axis about which the cylindrical surface is symmetrical;

clamping means, connected to the die and movable toward and away from said cylindrical surface, for temporarily engaging a wire blank and applying a clamping force to the wire blank, thereby firmly holding a portion of the wire blank in the groove of the die;

at least one sweep arm pivoted on said die axis; and

a positioning block having a face, and means, connected to the die, for mounting the block for movement from a first position, in which it would interfere with sweeping movement of the arm and in which the face is positioned at a location such that it can be engaged by an end of a wire blank tangent to the die and extending through the wire-receiving groove, to a second position in which the block permits clear sweeping movement of the sweep arm, the means for mounting the block also insuring that the face of the block is always at a predetermined distance from the

point at which the wire blank is tangent to the die when the block is in its first position.

4,566,306

METHOD AND APPARATUS FOR FEEDING MATERIALS TO BE PRESSED

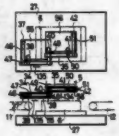
Masaru Orii, Machida, Japan, assignor to Yugengaisha Kyodogiken, Tokyo, Japan

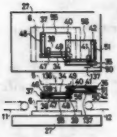
Filed Mar. 8, 1984, Ser. No. 587,535

Claims priority, application Japan, Mar. 17, 1983, 58-43130; Mar. 17, 1983, 58-43131

Int. Cl.⁴ B21D *43/10, 45/00*

U.S. Cl. 72—346 **14 Claims**





1. An apparatus for feeding materials to be pressed in an upper and lower metal mold, said apparatus having a carry-in arm and a carry-out arm, which have an infeed terminating position and an outfeed starting position, respectively, and which are provided with gripper means and moved pivotally in a horizontal direction and linearly in a vertical direction to feed a material to be pressed to and withdraw a pressed material from a press, comprising a fulcrum for a pivotal movement of at least one of said carry-in arm and said carry-out arm mounted on a rear surface of a bolster of said press, first gripper means provided on said carry-in arm for gripping a material to be pressed at peripheral positions thereof, said first gripper means and said material to be pressed entering a zone of movement of said upper metal mold in such a position that is in the vicinity of a dead point of pivotal movement of said carry-in arm at the infeed terminating position thereof, second gripper means provided on said carry-out arm for gripping a pressed material at peripheral positions thereof, said second gripper means and said pressed material entering a zone of movement of said upper metal mold in such a position that is in the vicinity of a dead point of pivotal movement of said carry-out arm at the outfeed starting position thereof, and means for timing the movements of the carry-in and carry-out arms so that the pressed material removed from said lower metal mold by the carry-out arm and the material to be pressed which is inserted into the press by the carry-in arm are aligned in a predetermined, vertically spaced relationship in a position above said lower metal mold in said press.

4,566,307

PIPELINE FLOW MEASUREMENT PROVING SYSTEM

John C. Boykin, Dallas, Tex., assignor to Electronic Flo-Meters, Inc., Garland, Tex.

Division of Ser. No. 429,610, Sep. 30, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 666,122

Int. Cl.⁴ G01F *25/00*

U.S. Cl. 73—3 **6 Claims**

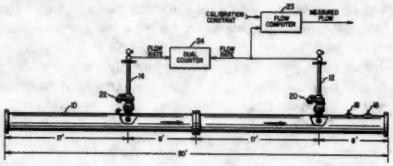
4. A method for proving the metering of a fluid passing through a main pipeline, comprising the steps of:

providing a continuous flow of said fluid through said main pipeline;

custody transfer metering the flow of said fluid through said main pipeline by use of a custody flow meter mounted on said pipeline, said custody transfer metering providing a custody transfer fluid measurement for a selected time period;

inserting a proving turbine flow meter turbine head into said fluid passing through said pipeline without stopping or rerouting the flow of said fluid through said pipeline;

calibration metering the flow of said fluid through said main pipeline by use of said insertion turbine flow meter having



said turbine head certified by means traceable to a standard at the National Bureau of Standards and mounted on said main pipeline at a distance of at least ten times the diameter of said main pipeline from said custody flow meter, said calibration metering producing a calibrated fluid measurement for said selected time period; and

comparing said custody transfer fluid measurement and siad calibrated fluid measurement to produce a calibration constant for calibrating said custody transfer metering.

4,566,308

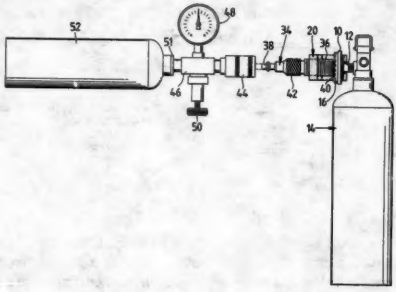
PORTABLE PRESSURE GAUGE TESTER

Robert F. Powell, Mount View, England, assignor to Amerex Corporation, Trussville, Ala.

Filed Nov. 5, 1984, Ser. No. 667,988

Int. Cl.⁴ G01F *27/00*

U.S. Cl. 73—4 R **8 Claims**



1. An apparatus for insitu testing of a gas pressure gauge having at least one pressure equalizing perforation therein comprising, in combination:

(a) a connector unit adapted to engage said gas pressure gauge and cooperate with said pressure equalizing perforation, including a generally U-shaped bracket having first and second extending members connected by a base member with said first extending member having a threaded bore therethrough perpendicular to the adjacent surface of said second extending member and with said second extending member having an outwardly opening slot therein;

(b) a conduit connector externally threaded at one end thereof for threaded engagement with said threaded bore;

(c) injecting means carried by said connector unit in communication with said pressure equalizing perforation for injecting pressurized gas into said gauge through said pressure equalizing perforation; and

(d) means operatively connected to said injecting means for indicating the pressure of said gas injected into said gauge.

4,566,309

APPARATUS AND METHOD FOR MONITORING A PRESSURE SENSOR

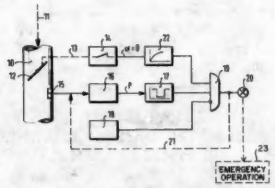
David van Beizen, Hemmingen; Gerhard Lotterbach; Jan F. van Woudenberg, both of Markgröningen, and Udo Zucker, Gü glingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1983, Ser. No. 511,056

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226849

Int. Cl.[4] G01L *27/00*

U.S. Cl. 73—4 R 33 Claims



1. An apparatus for monitoring a pressure sensor disposed downstream of a throttle valve in an intake tube of an internal combustion engine comprising, a throttle valve switch means for generating a logic signal when said throttle valve is closed, means for supplying an abnormal pressure signal from said pressure sensor, and means responsive to the simultaneous occurrence of said logic signal ($\alpha=0$) and said abnormal pressure signal for triggering an alarm means.

4,566,310

METHOD OF INSPECTING THE OPERATION OF A VALVE AND MECHANICAL TEST BENCH FOR PERFORMING THE METHOD

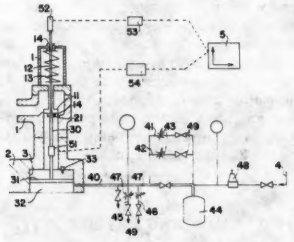
Serge Cohen, Meudon la Foret, and Gilbert H. K. Nguyen, Paris, both of France, assignors to Framatome & Cie, Courbevoie, France

Filed Mar. 10, 1983, Ser. No. 474,093

Claims priority, application France, Mar. 31, 1982, 82 05543

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—9 1 Claim



1. Mechanical test bench for a valve consisting of a flap (11) fixed to a rod (12) for sliding movement within a housing (1) by the action of a spring drive mechanism (13), comprising

(a) a support frame (2) for the valve to be tested, which has been dismounted with its drive mechanism;

(b) a jack (3) for the movement of said valve at adjustable speed, counter to the action of said spring, in the opening and closing direction of said valve, associated with a means (51) of measuring the force applied to said valve (11);

(c) a supply circuit (4) for supplying said jack (3) with a fluid, comprising two parallel branches (41, 42) supplying said jack (3) in two different flow ranges, each branch being equipped with a flow regulator (43);

(d) a drain circuit for evacuating said fluid from said jack during the closing movement of said valve under the effect of said spring, said drain circuit comprising two branches (45, 46) respectively corresponding to the flow ranges of the two branches (41, 42) of said supply circuit, each of said branches (45, 46) of said drain circuit being equipped with a flow regulator (47);

(e) a movement pick-up (52) to measure the position of said valve (11); and

(f) a plotting table (5) to which representative signals of the movement and of the force applied are passed in order to plot a representative test curve (C).

4,566,311

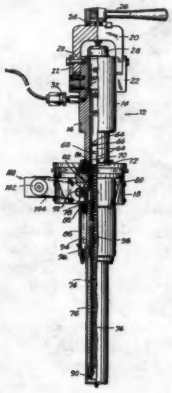
MERCURY PUMP

Harold T. Barnaby, Duncanville, Tex., assignor to Core Laboratories, Inc., Dallas, Tex.

Filed Sep. 10, 1984, Ser. No. 649,120

Int. Cl.[4] G01N *7/14*

U.S. Cl. 73—19 10 Claims



1. Mercury pump for testing the gas content of a geological core sample, comprising

a pump body having a vertically oriented chamber therein, a lower portion of which defines a mercury displacement chamber section and an upper part of which forms a sample chamber section into which the core sample can be inserted;

a removably securable sample chamber cap for sealing the top of said pump body;

a pressure transducer disposed in communication with the interior of said chamber and providing an output pressure signal;

a piston disposed in said mercury displacement chamber section and arranged to move vertically to displace mercury in said section;

drive means for driving said piston vertically in said mercury displacement chamber section, the drive means including an elongated vertical drive screw having said piston mounted on an upper end thereof; a drive housing; a hand wheel; a threaded, horizontally disposed input worm shaft coupled to said hand wheel; a drive sleeve mounted in said drive housing about said screw and rotationally driven by said input worm shaft; a threaded-race ball nut disposed about said screw and connected to said drive sleeve; a plurality of balls disposed in the threaded race of said ball nut defining therewith a return-ball race lifting mechanism for said vertical drive screw; and means holding said drive screw against rotation relative to said drive housing;

a displacement encoder rotationally coupled to said input worm shaft providing data indicating the direction of rotation of said worm shaft and a count for each predetermined increment of rotation thereof, said encoder providing on the order of one count for each one-thousandth of a cubic centimeter of displacement of said piston; and

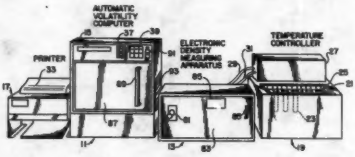
microprocessor-controlled volume measuring means having inputs coupled to said displacement encoder and to said pressure transducer for processing data determined from the counts from said displacement encoder to provide data relating to the gas content of said core sample.

4,566,312

APPARATUS AND PROCESS FOR AUTOMATICALLY DETERMINING FAT CONTENTS OF FOODS

Michael J. Collins, Matthews, and Ronald J. Goetchius, Charlotte, both of N.C., assignors to CEM Corporation, Matthews, N.C.

Filed May 2, 1984, Ser. No. 606,352
Int. Cl.[4] G01N *9/04, 25/56*
U.S. Cl. 73—32 A **18 Claims**



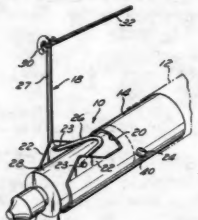
1. An apparatus for determining the fat content of a food which comprises means for automatically measuring a density characteristic of a food and producing an electronic signal corresponding to the density of the food, means for automatically measuring a solids content characteristic of a food and producing an electronic signal corresponding to the solids content of the food, computer means to determine the fat content of the food from the electronic signals, means for transmitting the electronic signals to the computer means, and means for reporting the fat content of the food.

4,566,313

WATER VESSEL LEAK DETECTOR AND METHOD OF DETECTING LEAKS

Gordon A. Monten, 25828 Fore Dr., Hemet, Calif. 92343

Filed May 11, 1984, Ser. No. 609,548
Int. Cl.[4] G01M *3/20*
U.S. Cl. 73—40.7 **4 Claims**



1. A leak detecting device for removably releasing colorimetric dye under water comprising:

an elongate telescoping pole for positioning said leak detecting device beneath the surface of said water;

a tubular member adapted to releasably mount to said pole, said tubular member having first and second ends and including a pair of opposing radially extending apertures therein;

mounting means disposed within said first end of said tubular member for releasably engaging said pole, said mounting means comprising a biased-spring member having a pair of pins extending through said apertures;

a deformable fluid reservoir for storing a quantity of dye, said reservoir sized to be received in said second end of said tubular member, said fluid reservoir having a single aperture through which said dye may be expelled; and

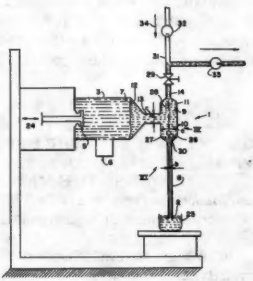
actuating means for dispensing dye from said fluid reservoir, said actuating means comprising an actuating lever having an attached string for effectuating movement of the actuating lever from the other end of said pole, said lever including a portion adapted to contact and moderately deform said reservoir in response to said effectuation of said actuating lever.

4,566,314

DEVICE AND METHOD OF MEASURING THE VISCOSITY AND/OR VISCO-ELASTICITY OF A FLUID

George B. Thurston, 1000 Madrone Rd., Austin, Tex. 78746

Filed Nov. 28, 1984, Ser. No. 675,522
Claims priority, application Netherlands, Dec. 2, 1983, 8304154
Int. Cl.[4] G01N *11/08*
U.S. Cl. 73—55 **26 Claims**



1. Apparatus for measuring the viscosity and/or the viscoelasticity of a fluid comprising: a measuring chamber that can be filled with a standard fluid and is provided with pressure generating means and with pressure sensing means and at least one measuring tube connected through a flexible diaphragm with the measuring chamber for receiving the fluid to be measured, and a coupling chamber that can be filled with a coupling fluid, the coupling chamber being interposed between the measuring tube and the diaphragm.

4,566,315

METER FOR MEASURING ERYTHROCYTE SETTLING RATES

Robert N. O'Brien; Philip M. McOrmond; Martin B. Hocking, and Kenneth R. Thornton, all of Victoria, Canada, assignors to University of Victoria, Victoria, Canada

Continuation-in-part of Ser. No. 389,252, Jun. 17, 1982, Pat. No. 4,474,056. This application Aug. 6, 1984, Ser. No. 638,248
Claims priority, application Canada, Aug. 18, 1981, 384115
Int. Cl.[4] G01N *15/04*
U.S. Cl. 73—61.4 **16 Claims**

1. A meter for measuring erythrocyte settling rates, comprising:

(a) a base providing a rack adapted to hold an array of tubes at an optimum settling angle;

(b) at least one tube to be held in said rack, said tube being adapted to contain a blood sample whose erythrocyte

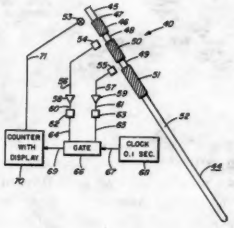
settling rate is to be determined, said tube wehn in said rack providing an upper window of predetermined length at the upper end thereof, said upper window permitting passage of ambient light therethrough, a lower window of predetermined length adjacent the upper end thereof but below said upper window, said lower window permitting passage of ambient light therethrough, and an opaque section separating said lower window from said upper window;

(c) timing means actuated by the passage of ambient light through said windows when said tube contains blood, to determine the erythrocyte settling rate, said timing means comprising

(i) an upper photodiode activated by the passage of ambient light through said upper window when the erythrocytes in the blood in said tube settle, to commence cumulative time interval counting representative of the erythrocyte settling rate; and

(ii) a lower photodiode activated by the passage of ambient light through said lower window to stop the cumulative time interval counting representative of the erythrocyte settling rate;

said erytyrocyte settling rate being determined by the exact interval of time which has elapsed between when ambient light passes through said upper window, indicative of the substantial absence of erythrocytes in the area of said upper window, and when ambient light passes through said lower window, indicative of the substantial absence of erythrocytes in the area of said lower window.



4,566,316

WASHER TYPE PRESSURE SENSOR

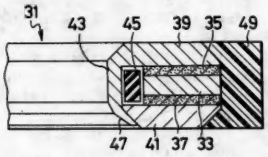
Kiyoshi Takeuchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 10, 1984, Ser. No. 569,586

Claims priority, application Japan, Jan. 10, 1983, 58-1412[U]

Int. Cl. G01L *9/08*; G01M *15/00*

U.S. Cl. 73—754 **7 Claims**



1. A washer type pressure sensor for detecting a pressure applied thereto by an ignition plug inserted into the washer-type sensor, comprising:

at least one ring-shaped piezoelectric element;

a ring-shaped electrode plate in close contact with said piezoelectric element;

a first ring-shaped pressure receiving plate adapted to engage an ignition plug;

a second ring-shaped pressure receiving plate adapted to engage a cylinder head, said piezoelectric element and said electrode plate being positioned between said first and second ring-shaped receiving plates;

a metallic inner cylindrical protecting portion integrally formed with said first pressure receiving plate and extending from the inner periphery of said first pressure receiving plate to said second pressure receiving plate, saidmetallic protecting portion having a thickness sufficient to protect the inner peripheries of said piezoelectric element and said electrode plate from shock; and

an outer cylindrical portion comprising a plastic extending from the outer periphery of said first pressure receiving plate to said second pressure receiving plate.

4,566,317

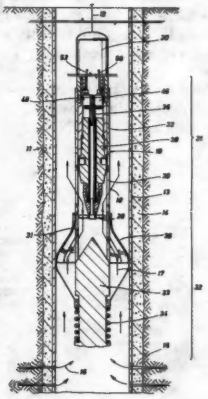
BOREHOLE FLOW METER

Farid J. Shakra, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jan. 30, 1984, Ser. No. 575,117

Int. Cl.[4] E21B *47/10*

U.S. Cl. 73—155 **12 Claims**



1. Wellbore fluid flow measuring apparatus comprising,

an elongated body adapted for passage through a wellbore and having a given portion through which wellbore fluids may pass,

a disk comprising at least three substantially flat vanes rotatably mounted in said body in a plane perpendicullar to the axis of the body and in isolation from said borehole fluid,

non-magnetic means for turning said disk in proportion to the rate of fluid flow through said given body portion,

sensing means in isolation from said borehole fluids, comprising two spaced apart detectors disposed in close proximity to the surface of said disk for respectively generating for each detector a pulse train signal indicative of the disk's turning rate,

the spacing of the detectors relative to the axis of the body and the width and number of the vanes being selected so as to generate a phase difference of about ninety degrees between the two pulse train signals in response to the rotation of the disk, and

means for communicating said pulse train signals to the surface.

4,566,318

METHOD FOR OPTIMIZING THE TRIPPING VELOCITY OF A DRILL STRING

M. Vikram Rao, and John E. Fontenot, Jr., both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,284
Int. Cl.[4] E21B 45/00
U.S. Cl. 73—151 20 Claims

1. A method for optimizing the tripping velocity of a drill string useful to increase the efficiency of a drilling operation while maintaining the hydraulic fluid pressure of the drilling fluid in the borehole within an aceptable range, comprising:

measuring during tripping the hydraulic fluid pressure of the drilling fluid in the borehole near the drill bit in a plurality of intervals longitudinally spaced along the borehole;

measuring the tripping velocity of the drill string in said intervals;

comparing said measured fluid pressure for each of said intervals in the borehole with predetermined acceptable fluid pressure ranges for each corresponding interval; and

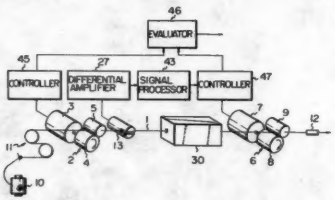
adjusting for subsequent trips the tripping velocity in each of said intervals in order to maximize the tripping velocity while maintaining the measured pressure within the acceptable fluid pressure range for each interval.

4,566,319

PROCESS AND APPARATUS FOR MEASURING THERMAL SHRINKAGE PROPERTIES OF YARN

Chikayasu Yamazaki; Jun Torikai, both of Otsu, and Ichiro Kumo, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,431
Claims priority, application Japan, Apr. 9, 1982, 57-58022
Int. Cl.[4] G01N 33/36
U.S. Cl. 73—160 23 Claims



1. A process for measuring thermal shrinkage properties of yarn, which comprises the steps of:

traveling a yarn through a substantially straight and horizontal yarn path between a feed roller maintained at a desired constant peripheral speed V_1 and a draw roller;

applying heat treatment to the traveling substantially straight yarn during straight yarn travel along said path between the feed roller and the draw roller by contacting said straight traveling yarn with hot water so that the traveling yarn thermally shrinks;

detecting tension of the straight traveling yarn downstream of the feed roller;

driving the draw roller at a peripheral speed V_2 by obtaining the difference of the desired constant tension T_0 minus the detected tension T, subjecting the difference to a proportional and integral circuit, driving the draw roller in response to an output of the proportional and integral circuit and regulating a control gain of the proportional and integral circuit in proportion to the output thereof so that the detected tension T of the traveling yarn becomes equal to a desired constant tension T_0; and

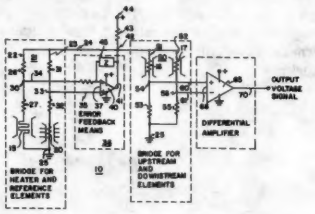
obtaining the thermal shrinkage S(%) of the traveling yarn by the equation of $S=[(V_1-V_2)/V_1]\times 100$.

4,566,320

FLUID FLOW SENSING MEANS WITH AMBIENT TEMPERATURE COMPENSATION

Philip J. Bohrer, Minneapolis, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed May 7, 1984, Ser. No. 607,547
Int. Cl.[4] G01F 1/68
U.S. Cl. 73—204 20 Claims



1. A flow supporting means to sense fluid ambient temperature having a defined flow path including means supporting at least two resistors affected by a fluid flow in said path, including: first bridge means having two branches connected to a source of variable potential; said first bridge means having output means intermediate said branches; a first resistor of said two resistors affected by said fluid flow connected in a first of said branches; said first resistor acting as a heater resistor; a temperature responsive resistor mounted in a heat exchange relationship with said supporting means to sense fluid ambient temperature said temperature responsive resistor connected in a second of said branches; error feedback means having input means connected to said output means of said first bridge means; said error feedback means having output means connected to said two parallel branches to provide said source of variable potential to in turn controllably energize said first bridge means; second bridge means having two branches with said two branches connected to said output means of said error feedback means; said second bridge means having a branch including said second of said two resistors with said second resistor being a temperature dependent resistor in said flow path; and said second bridge means having output means connected intermediate said branches of said second bridge means.

4,566,321

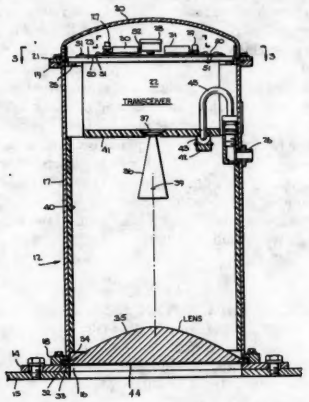
MICROWAVE TANK-CONTENTS LEVEL MEASURING ASSEMBLY WITH LENS-OBTURATED WALL-OPENING

Joseph M. Zacchio, Wethersfield, Conn., assignor to Transamerica Delaval Inc., Princeton, N.J.

Filed Jan. 18, 1985, Ser. No. 692,576
Int. Cl.[4] G01F 23/28; G01S 13/08
U.S. Cl. 73—290 R 12 Claims

1. A microwave tank-contents level measuring assembly comprising in combination a housing, a microwave transmitter-receiver system coupled to a horn radiator-receptor for emitting a microwave preselected ranging signal to be reflected from the surface of the tank-contents for detection and level determination, said housing having a wall with an opening, said system and horn being mounted within said housing for transmitting and receiving said ranging signal through said wall opening, a dielectric microwave lens, impermeable to fluid, disposed over said opening and joined to said housing with at least a fluid-tight seal, said lens being geometrically shaped and constructed so as to collimate said preselected ranging signal during its outward passage and, on the return passage, to focus said preselected ranging signal at a point substantially coincident with the effective phase center of said horn, and means for securing said housing with said lens-

obturated wall-opening over an opening in a top wall of a tank with said lens establishing at least a fluid-tight seal over said



tank opening whereby the level of any contents of the tank is monitored by the measuring assembly.

4,566,322

APPARATUS FOR ELECTRICALLY MEASURING THE LEVEL OF A LIQUID IN A CONTAINER, PARTICULARLY IN THE GASOLINE TANK OF A VEHICLE

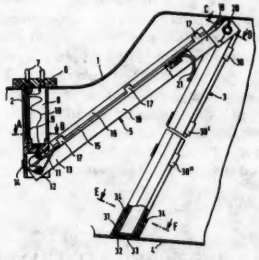
Karl Rau, Mühlheim; Heinz Kalk, Neu-Isenburg, and Gerhard Metzger, Glasshütten, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 601,452

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314901

Int. Cl.[4] G01F *23/24, 23/26*

U.S. Cl. 73—295 **28 Claims**



1. In a device for electric measurement of the level of a liquid in a container, particularly the gas tank of a vehicle, having a conductive foil enclosed and supported by a conductive-foil support which is formed as a protective tube, which foil may serve as a temperature-dependent, externally heated resistor or an electrode of a measurement capacitor, and wherein the device has comprises a spring which presses the support against a bottom of the container, the improvement wherein

said support is divided into three approximately rigid sections, namely, an inner section, a central section, and an outermost section; said inner and said central sections as well as said central and said outermost sections being pivotally connected together and being spring loaded such that the outermost section of the support can rest against the bottom of the container and against a top side of the container.

4,566,323

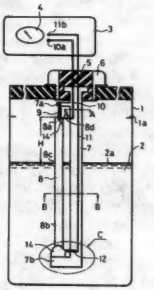
LIQUID HELIUM LEVEL INDICATING GAUGE

Tsuyoshi Masumoto; Akihisa Inoue, both of Sendai; Yoshimi Takahashi, Shiraishi; Akira Hoshi, Izumi, and Uichiro Mizutani, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 29, 1983, Ser. No. 518,523

Int. Cl.[4] G01F *23/24*

U.S. Cl. 73—295 **4 Claims**



1. A sensing device for indicating the level of liquid helium within a container including in combination, a resistance wire sustained vertically within said container and an electrical indicating device for producing an indication which varies with the electrical resistance of said resistance wire,

said resistance wire being made of a superconductive material of which more than 20 volume % is in an amorphous phase and which is composed of a parts of element Z, b parts of element M, and c parts of a composition of elements Q, R and Al,

said Z being one selected from the group consisting of the elements of Zr, Hf and Ti, said M being one selected from the group consisting of elements of V, Nb, Ta and the mixture thereof, said Q being one selected from the group consisting of the elements of Si, Ge and the mixture thereof, said R being one selected from the group consisting of C, B, Sn and the mixture thereof, said a ranging from 10 to 90 atomic %, said b being below 80 atomic %, said c ranging from 10 to 25 atomic %, and

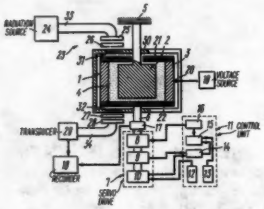
the composition ratio of said Q being more than 2 atomic % inclusive, the composition ratio of Al being in a ranges from 0.1 to 15 atomic % and the composition ratio of said R being less than 12 atomic % inclusive.

4,566,324

METHOD AND DEVICE FOR DETERMINATION OF RHEOLOGICAL CHARACTERISTICS OF POLYMER AND DISPERSE SYSTEMS

Georgy V. Vinogradov, Leninsky prospekt, 70/11, kv. 99, Moscow; Jury F. Deinega, ulitsa Tverskaya, 6, kv. 19, Kiev; Jury G. Yanovsky, Okruzhnoi proezd, 22/64, kv. 92; Olga V. Vasilieva, Michurinsky prospekt, 10, kv. 157, both of Moscow; Alexandr A. Konstantinov, ulitsa Donskaya, 3, kv. 12, and Mikhail M. Chernysh, Leninsky prospekt, 44, kv. 143, both of Moscow, all of U.S.S.R.

Filed Dec. 26, 1984, Ser. No. 686,217
Claims priority, application U.S.S.R., Jan. 5, 1984, 3708254
Int. Cl.[4] G01N *11/14*
U.S. Cl. 73—60 2 Claims



1. A method for determination of rheological characteristics of polymer and disperse systems comprising the steps of:

(a) placing one of said systems to be investigated in a gap between a first and a second coaxial cylinder;

(b) subjecting said system to mechanical deformation of a restricted shear flow by tangentially displacing said first cylinder in relation to said second cylinder and applying three conditions, the first of said conditions including a continuous constant-rate shear deformation, a second condition including harmonic oscillations, and a third condition including a superimposition of harmonic oscillations of said shear deformation at a continuous rate;

(c) exposing said system to an electrical field having force lines which are perpendicular to a direction of a flow of said system and whose intensity does not exceed a breakdown strength of said system; and

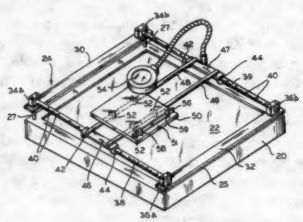
(d) measuring a magnitude of a double refraction of said system exposed to said mechanical deformation, said electrical field force and said applied magnitude of deformation to determine the rheological characteristics of said system.

4,566,325

HANDS-ON INSPECTION BOARD FOR PRINTED CIRCUIT CARDS

John Rante, 406 E. Ravine, Willow Springs, Ill. 60480

Filed Jan. 14, 1985, Ser. No. 691,423
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—432 R 15 Claims



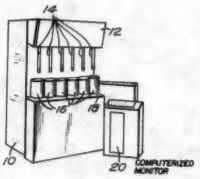
1. A hands-on inspection board comprising a spaced parallel pair of side rails, each of said side rails having a series of uniformly spaced stops distributed along the length thereof, a sliding support having upper and lower sliding bearings associated with each of said side rails, said side rails being threaded through openings in said sliding bearings, the opening in one of said sliding bearings having a cross section conforming to the cross section of said side rail, the opening in the other of said sliding bearings being elongated so that either gravity may make the top of said elongated bearing opening rest on the top of said side rail or an inspector may lift said other slide bearing to make the bottom of said elongated bearing opening rest on the bottom of said side rail, latch means associated with the top of said elongated opening for engaging said stop means, and a platen mounted on rods extending between said sliding supports for enabling a back and forth platen traverse across said rods and between said side rails.

4,566,326

AUTOMATIC VOLUMETRIC SORPTION ANALYZER

Seymour Lowell, Albertson, N.Y., assignor to Quantachrome Corporation, Syosset, N.Y.

Filed Jul. 9, 1984, Ser. No. 628,918
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—432 PS 5 Claims



1. An analyzer for performing independent measurement analyses on a plurality of powder samples, said analyzer comprising a common manifold, a plurality of sample cells for holding a powder sample to be analyzed, a plurality of valve means respectively interposed between said manifold and said plurality of sample cells, control means operatively connected to said plurality of valve means for selectively effecting fluid communication between said manifold and said plurality of sample cells, a first pressure sensor in communication with said manifold, and a plurality of additional second pressure sensors in respective communication with said plurality of sample cells for respectively determining the pressure in said sample cells, said control means being effective to close a selected one of said valve means while pressure equilibrium is being established in an associated one of said sample cells and to open selectively others of said valve means to allow gas to be transferred from said manifold to associated others of said sample cells.

4,566,327

SYSTEM AND TECHNIQUE FOR BANDWIDTH IMPROVEMENT IN MULTIFUNCTION SENSORS

Billie F. Rider, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 435,516, Oct. 20, 1982, and a continuation-in-part of Ser. No. 370,641, Apr. 21, 1982, Pat. No. 4,444,053. This application Jan. 13, 1984, Ser. No. 570,479
Int. Cl.[4] G01P *15/09*
U.S. Cl. 73—510 7 Claims

1. A transducer and signal demodulating system comprising:

at least one first acceleration sensor and at least one second acceleration sensor mounted for rotation about a common axis, said at least one first and said at least one second sensor being angularly spaced by an angle of 90° with respect to one another about said axis;

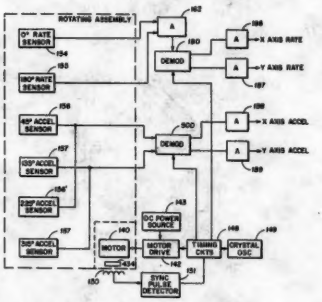
means for providing a first signal from said at least one first

sensor and means for providing a second signal from said at least one second sensor;

means for receiving and varying the amplitude of each of said first and second signals for providing first and second transducer signals, respectively;

means coupled to said first transducer signal for providing an inverted first transducer signal and means coupled to said second transducer signal for providing an inverted second transducer signal;

first and second switch means for providing first and second demodulation outputs, each of said first and second switch means including a first switch having an input and output with the input of said first switch being coupled to receive said first transducer signal, a second switch having an input and an output with the input of said second switch being coupled to receive said inverted first transducer



signal, a third switch having an input and an output with the input of said third switch being coupled to receive the second transducer signal, and a fourth switch having an input and an output with the input of said fourth switch being coupled to receive the inverted second transducer signal, the output of each of said first, second, third, and fourth switches of said first switch means being coupled in common to provide a first demodulation output and the output of each said first, second, third and fourth switches of said second switch means being coupled in common to provide a second demodulation output, each of said switches having a means for intermittently coupling the input of each switch to its output in response to a switching signal, wherein each of said demodulation outputs represents acceleration in an axis perpendicular to one another and to said common axis.

4,566,328

ELECTROSTATIC-SUSPENSION ACCELEROMETERS

Alain M. Bernard, Fresnes; Georges-Marie J. Le Clerc, Arpajon, and Bernard M. Foulon, Neuilly, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales (ONERA), France

Filed Apr. 20, 1984, Ser. No. 602,466

Claims priority, application France, Apr. 21, 1983, 83 06528

Int. Cl.[4] G01P *15/125, 15/13*

U.S. Cl. 73—517 B **6 Claims**

1. An electrostatic triaxial accelerometer comprising:

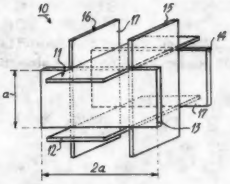
an accelerometer body;

a test weight movable with respect to said accelerometer body, electrically connected thereto by a highly flexible conductor lead;

said test weight including six planar plates regularly assembled such that the inside volume defined by said plates is a cube with a side smaller in length than the plates, said test weight thus carrying planar surface elements oppositely arranged in parallel two by two, forming three pairs of surface elements;

electrodes fixed to said body and forming capacitors with respect to said test weight surface elements;

means for detecting the test weight position by means of measurement voltages fed to said electrodes;



means for positioning said test weight by electrostatic forces developed from cueing voltages fed to said electrodes;

whereby this arrangement makes it possible to secure a high surface to weight ratio for the test weight needed for the electrostatic suspension.

4,566,329

VECTORIAL FORCE SENSOR WITH ELASTIC SURFACE WAVES

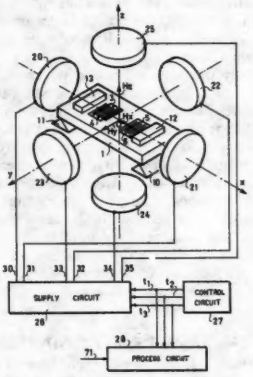
Jean P. Castera, Orsay, and Paul L. Meunier, Paris, both of France, assignors to Thomson CSF, Paris, France

Filed Jan. 18, 1985, Ser. No. 692,546

Claims priority, application France, Jan. 27, 1984, 84 01290

Int. Cl.[4] G01P *15/08;* **G01N** *29/00*

U.S. Cl. 73—597 **3 Claims**



1. A vectorial force sensor with elastic surface waves, comprising a bar on which is exerted a stress to be measured and which possesses a measuring face; an assembly of oscillator means for elastic surface waves, arranged on the measuring face and maintaining an elastic wave of specific polarization direction (S); the said force sensor also incorporating: at least three magnetic means inducing magnetic fields in the bar, the first means inducing a first magnetic field (Hx) parallel to the direction of polarization (S) of the elastic surface wave, the second means inducing a second magnetic field (Hy) perpendicular to the direction of polarization (S) of the elastic wave and parallel to the measuring face, and the third means inducing a third magnetic field (Hz) perpendicular to the measuring face; a sequential control circuit making it possible to control the magnetic means sequentially; and measuring means connected to each measuring oscillator means and supplying results of measurement of the propagation speed of the elastic waves for each operating sequence provided by the sequential control circuit, process circuits receiving the results of measurement of the propagation speeds and supplying the vectorial

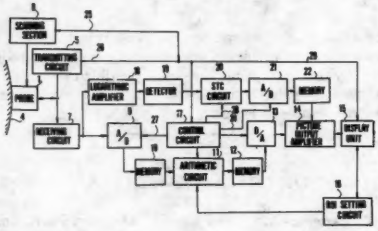
value of the stress exerted on the bar on the basis of a vectorial combination of the three measurements.

4,566,330

ULTRASONIC MEASUREMENT METHOD, AND APPARATUS THEREFOR

Tadashi Fujii, Fujinomiya, and Yoshinori Hayakawa, Ibaraki, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 657,028
Claims priority, application Japan, Dec. 7, 1983, 58-229853
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—599 **10 Claims**



1. An ultrasonic measurement method for obtaining quantitative information relating to ultrasonic characteristics of an object under investigation, comprising the steps of:

(a) transmitting ultrasonic pulses having a plurality of different frequencies into the object under investigation,

(b) detecting echos of the ultrasonic pulses reflected from within the object,

(c) subjecting the detected echos, which exhibit a plurality of frequencies, to information processing to derive a mean value of attenuation coefficients measured on the basis of two different frequencies, and a mean value of attenuation coefficients measured on the basis of three different frequencies inclusive of the first two frequencies; and

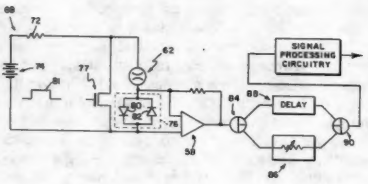
(d) deriving information relating to an attenuation coefficient of the object from said mean value of attenuation coefficients measured on the basis of two different frequencies, and said mean value of attenuation coefficients measured on the basis of three different frequencies inclusive of the first two frequencies.

4,566,331

ULTRASONIC DRIVER AND RECEIVER

Eugene Schroeder, Indianapolis, Ind., assignor to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Filed Apr. 6, 1984, Ser. No. 597,343
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—632 **15 Claims**



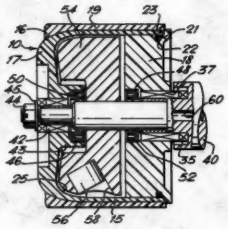
1. A system for driving an ultrasonic transducer for use in ultrasound imaging of a target, the system comprising means for generating a charging voltage, a first impedance for coupling the charging voltage generator to a terminal of the transducer to permit the transducer to charge sufficiently slowly from the charging voltage source so that charging strain is not coupled from the transducer to the target, a switch, and means for coupling the switch to the transducer, closing of the switch permitting the transducer to discharge sufficiently rapidly that discharging strain is coupled from the transducer to the target.

4,566,332

WHEEL PROBE

John C. Collingwood, East Hagbourne, England, assignor to British Gas Corporation, London, England

Filed Jul. 10, 1984, Ser. No. 629,480
Claims priority, application United Kingdom, Aug. 4, 1983, 3321025
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—639 **8 Claims**



1. A wheel probe for ultrasonically inspecting a component, comprising a hollow wheel having spaced end walls and an annular wall defining a rim, the inner surfaces of the end walls and the rim defining a chamber containing an acoustic coupling liquid, stationary mounting means supporting the wheel for free rotation, the mounting means including an annular mounting member supporting an ultrasonic transducer for directing and receiving ultrasound through the rim of the wheel, the mounting member comprising material for attenuating sound, being located within the chamber so as to substantially fill the same and having end surfaces and an annular outer surface respectively spaced from the inner surfaces of the end walls and the rim so as to define a small gap therewith, thereby to inhibit ultrasound from reaching the transducer, the small gap being filled with the coupling liquid.

4,566,333

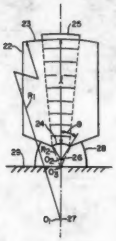
FOCUSING ULTRASONIC TRANSDUCER ELEMENT

Noriyoshi Chubachi, 4-6-203, Katahira 1-chome, Sendai-shi, Miyagi-shi; Junichi Kushibiki, 48, Aza Nakazaike, Arai, Sendai-shi, Miyagi-ken, and Kouichi Nakanishi, Aichi, all of Japan, assignors to Keisuke Honda; Noriyoshi Chubachi and Junichi Kushibiki, all of Aichi, Japan

Filed Jul. 18, 1984, Ser. No. 632,206
Claims priority, application Japan, Aug. 8, 1983, 58-144728
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—642 **8 Claims**

1. A focusing ultrasonic transducer element comprising an ultrasonic propagating medium having a convex spherical portion with a convex spherical surface in one end thereof and a concave spherical portion with a concave spherical surface in the other end thereof and an ultrasonic transmitting and receiving transducer attached on the surface of said convex spherical

portion, an axis of symmetry of said convex spherical portion being aligned with that of said concave spherical portion and a



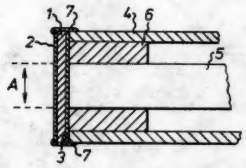
center point of said convex spherical portion being offset from that of said concave spherical portion.

4,566,334

ULTRASONIC DETECTOR DEVICE

Hans A. W. Persson, Ilongränd 90, S-223 71 Lund, Sweden

Filed Jun. 8, 1984, Ser. No. 618,481
Claims priority, application Sweden, Jun. 14, 1983, 8303366
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—649 **10 Claims**



1. An ultrasonic detector device for converting ultrasonic signals into electrical signals, comprising

an electrode,

an electrically conductive casing enclosing the electrode so as to form a shield therefor,

an opening in the casing around a distal end of the electrode,

a piezoelectric film applied on and extending beyond the entire end surface of the distal end of the electrode,

a thin, electrically conductive layer exclusively on the side of the film opposite to the electrode, and

connection means electrically connecting the shield and the electrically conductive layer.

4,566,335

METHOD AND APPARATUS FOR TESTING FIBER REINFORCED PLASTIC LAMINATES

Surendra N. Singhal, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

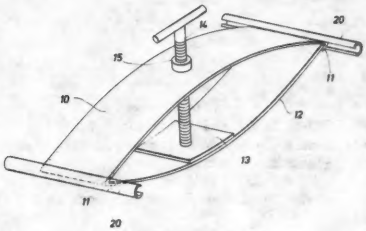
Filed Aug. 16, 1984, Ser. No. 641,154
Int. Cl.⁴ G01N *3/20*
U.S. Cl. 73—849 **3 Claims**

1. An apparatus for applying a variable bending load to a fiber reinforced plastic test specimen, said apparatus comprising:

an elongated rectangular metal frame member, said frame member having an arcuate shape with the ends of said frame member being shaped to retain said test specimen;

means secured to the center of the frame for applying a bending load, said means comprising a threaded member that engages a threaded opening dispersed in said frame; and

a pair of elongated tubular members, one of said tubular members being attached to each end of said frame member



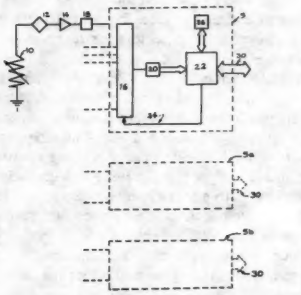
with the axis of the tubular member at substantially a right angle to the axis of the frame member.

4,566,336

NAVIGATIONAL AID ALERTING SYSTEM

John G. German, Mont St. Hilaire; Abraham Benjamin, Montreal, and James F. Stirling, Dorval, all of Canada, assignors to Canadian Patents & Development Ltd. Société Canadienne des Brevets et d'Exploitation Limited, Ottawa, Canada

Filed Jun. 27, 1983, Ser. No. 508,458
Int. Cl.⁴ G01B *7/16*
U.S. Cl. 73—772 **10 Claims**



1. A scanning device for use with an array of sensors, said scanning device comprising:

A. At least one remote data acquisition unit comprising:

(a) a microprocessor;

(b) an analog multiplexer having a plurality of inputs, each input connected in a one-to-one correspondence with a sensor of said array, said microprocessor controlling the sequential scanning of said multiplexer;

(c) an analog-to-digital converter connected to an output of said multiplexer for converting analog signals generated by said sensor array into corresponding digital data signals, the output of said analog-to-digital converter being connected to said microprocessor; and

(d) a RAM connected to said microprocessor, wherein said microprocessor stores an address identifying a sensor of said array and the magnitude of said digital data signals from said array, and wherein said microprocessor sequentially codes said addresses and said digital data signals in said RAM for transmission on a data bus;

B. A master control unit comprising:

(a) a master microprocessor, connected to said data bus, wherein said master microprocessor compares said data signals with two predetermined levels for producing first, second and third status signals; and

(b) a display means for displaying said first, second and third status signals.

4,566,337

OPTO-ELECTRONIC POSITION SENSING

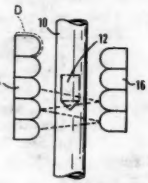
Michael G. Smart, Camberley, England, assignor to G. A. Platon Limited, Hampshire, England

Filed Jul. 24, 1984, Ser. No. 634,024

Claims priority, application United Kingdom, Jul. 28, 1983, 8320405

Int. Cl.⁴ G01F *1/26*; G01N *21/84*

U.S. Cl. 73—861.56 **21 Claims**



1. An opto-electronic position-sensing system comprising:

a series of emitting sources for generating radiation,

a series of radiation detectors for receiving said radiation,

a movable member located between said emitting sources and said detectors for affecting radiation reception of various affected elements of said detectors by blocking radiation from said sources to said elements according to a longitudinal position of said member relative to said sources, each affected element being adapted to produce an analog output signal having a magnitude varying from a minimum to a maximum and responsive to said position of said member in such a manner that output signals of at least two of said elements of said detectors vary in accordance with movement of said member,

first means for identifying said affected elements having low outputs by digital analysis of said output signals from said detectors so as to indicate the position of said member in said system, and

second means for subsequently precisely determining said position of said member by analog analysis of said output signals from said affected elements identified by said first means.

4,566,338

NONCONTACT TORQUE SENSOR

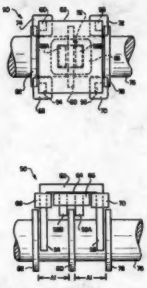
William J. Fleming, Rochester, and Dumitru Raceu, Warren, both of Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Jul. 20, 1984, Ser. No. 633,057

Int. Cl.⁴ G01L *3/10*

U.S. Cl. 73—862.36 **22 Claims**

2. Apparatus as set forth in claim 1, wherein said shaft has first and second radially extending surfaces facing in opposite axial directions, said means for generating includes at least two pole means each disposed adjacent to a corresponding one of said first and second radially extending surfaces, and said means for detecting including means for detecting magnetic flux in said pole means and providing an output signal indicative of the total amount of flux in both said pole means, said



output signal being unaffected by axial and radial movements of said shaft.

4,566,339

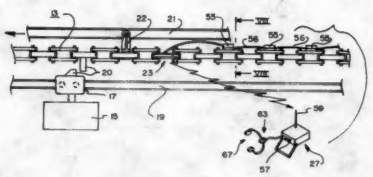
CHAIN PULL MONITOR SYSTEM

Marion A. Davidson, and David B. Kiss, both of Memphis, Tenn., assignors to Southern Systems, Inc., Memphis, Tenn.

Filed Dec. 23, 1983, Ser. No. 565,150

Int. Cl.⁴ G01L *5/10*

U.S. Cl. 73—862.39 **12 Claims**



12. A chain pull monitor system for monitoring the tensile stresses of a conveyor chain while under load and in operation, said system comprising:

(a) sensing means mounted directly to said chain for sensing the strain experienced by said chain while under load and in operation and for producing an electrical signal based on said strain; said sensing means including a body member interposed in said chain and including first and second active resistor elements for producing resistance proportional to the stress applied to said body member; said sensing means including a source of electrical energy coupled to said resistor elements for coacting with said resistor elements to produce a low voltage electrical signal proportional to the resistance produced by said resistor elements and including a voltage-to-frequency converter means for producing a voltage output proportional to the electrical signal produced by the coaction between said source of electrical energy and said resistor elements;

(b) transmitting means mounted on said chain and coupled to said sensing means for receiving said electrical signal from said sensing means, converting said electrical signal into a radio signal for the transmission thereof;

(c) receiving means for receiving said radio signal from said transmitting means and for presenting said radio signal in an intelligible form;

(d) a track;

(e) trolleys for supporting said chain from said track; and

(f) containers in which said transmitting means, said source of electrical energy and said voltage-to-frequency converter means are housed; said containers being attached to said chain and being of a sufficiently small size and so

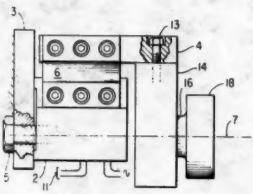
positioned to fit within the transverse silhouette of said trolleys.

4,566,340

FORCE TRANSDUCER

William H. Compton, Valley View, and Joseph M. Likozar, Highland Heights, both of Ohio, assignors to Comptrol Incorporated, Cleveland, Ohio

Filed Feb. 16, 1984, Ser. No. 580,940
Int. Cl.[4] G01L 5/10, 1/26
U.S. Cl. 73—862.48 4 Claims



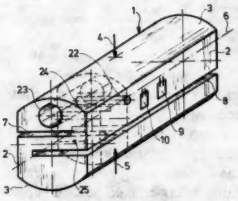
1. In a transducer generating an output signal corresponding to the magnitude of a force, a force receiving member cantilevered through a spring flexure from a base angularly adjustable about an axis whereby the moment impressed on said flexure by a force applied to said force receiving member and the resulting displacement of said force receiving member from a null position is a function of the magnitude of the force and the angular adjustment of the transducer, and a control couple having relatively movable elements operatively connected to said base and force receiving member respectively generating an output signal corresponding to the displacement of the force receiving member from the null position.

4,566,341

ELECTROMECHANICAL MEASURING CONVERTER PIN

Sándor Kovács, Budapest, Hungary, assignor to Vasipari Kutato es Fejleszto Vallalat, Budapest, Hungary

Filed Apr. 30, 1984, Ser. No. 605,638
Claims priority, application Hungary, Apr. 29, 1983, 1473/83
Int. Cl.[4] G01L 1/22
U.S. Cl. 73—862.65 6 Claims



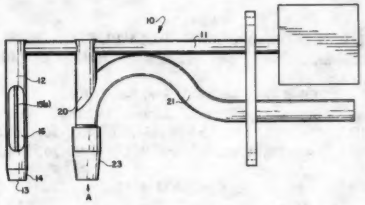
1. Electromechanical measuring converter pin, particularly for measuring force of varying influence line, characterized in that it has a pair of two opposite cylindrical and flat surfaces (2,3), where the points or lines of application of force and reaction force (4,5) are on the cylindrical surfaces (3) and recesses (7,8) are machined along the full length of both flat surfaces parallel with and extending over the geometric axis (6) of the pin (1), the walls of the recesses (7,8) are parallel with each other and at least two deformation sensors (9,10,11,12) connected to measuring bridge (13) are arranged on the flat surface and below the recesses (7,8) starting from the given flat surface (2).

4,566,342

ISOKINETIC EXTRACTIVE SAMPLING PROBE

Jerome L. Kurz, 33 Losrobles Dr., Carmel Valley, Calif. 93924

Filed May 5, 1983, Ser. No. 491,881
Int. Cl.[4] G01N 1/20
U.S. Cl. 73—863.03 16 Claims



1. An isokinetic extractive sampling probe comprising in combination:

an elongated probe conduit including,

a first thermal flow sensor contained within a first tubular section depending from said probe conduit, said first flow sensor directed towards monitoring the velocity of a fluid stream passing thereby,

a second thermal flow sensor contained within a second tubular section depending from said probe conduit, said second thermal flow sensor directed towards monitoring the velocity of an extractive sample of the fluid being withdrawn from the fluid stream through an extractive conduit,

said second thermal flow sensor being parallel to the first thermal flow sensor and axially aligned with said second tubular section and

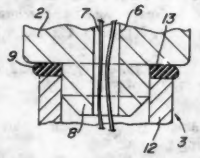
a first and second temperature sensor to register changes in the ambient temperature of the fluid stream, whereby the differential output between said first thermal flow sensor monitoring the velocity of the fluid stream, and said second thermal flow sensor monitoring the velocity of the extractive sample is used to automatically adjust the flow-rate of the extractive sample being withdrawn through said extractive conduit by pumping means so that velocity of the extractive sample within said extractive conduit is equal to the velocity of the fluid stream, thereby ensuring isokinetic sampling of the fluid streams at the point of measurement.

4,566,343

SAMPLING AND/OR MEASURING APPARATUS FOR IMMERSION IN MOLTEN METAL

Alfons L. Theuwis, Zonhoven, and Joseph M. Maes, Hechtel, both of Belgium, assignors to Electro-Nite Co., Philadelphia, Pa.

Filed May 18, 1984, Ser. No. 611,788
Claims priority, application Belgium, Nov. 28, 1983, 2/60271
Int. Cl.[4] G01N 1/12
U.S. Cl. 73—864.59 12 Claims



1. Apparatus for immersion into molten metal comprising a lance supporting a disposable probe, said probe being tele-

scoped over an immersion end of said lance, said lance having a shoulder adjacent one end of said probe, means for protecting the shoulder while permitting contact between said probe and shoulder, said means including an elastic ring seal between said shoulder and an adjacent end portion of said probe, said seal being disposable after a single use.

4,566,344

CLUTCH MECHANISM IN PUSHBUTTON TUNER

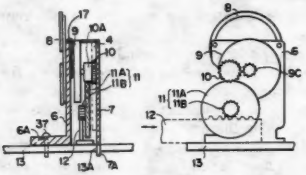
Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 561,864

Claims priority, application Japan, Dec. 16, 1982, 57-190733[U]; Dec. 16, 1982, 57-190734[U]; Dec. 16, 1982, 57-190735[U]; Dec. 16, 1982, 57-190736[U]; Dec. 16, 1982, 57-190737[U]

Int. Cl.⁴ H03J *5/12*

U.S. Cl. 74—10.33 **2 Claims**



1. A clutch mechanism in a pushbutton tuner which comprises:

a clutch base plate having at least one hole therethrough;

a manually rotatable tuning gear disposed on one side of said clutch base plate and adapted for effecting manual tuning of the tuner, said tuning gear having a rotation axle extending through said hole;

an inner gear disposed on the opposite side of said clutch base plate from said tuning gear and being drivingly engaged with said tuning gear so that rotational movement of said tuning gear can be transmitted to a tuning circuit element to change a constant of said circuit element;

a horseshoe-shaped stopper engaging said rotation axle on said opposite side of said clutch base plate for securing said rotation axle with respect to said clutch base plate while permitting rotation of said tuning gear;

a clutch plate spaced from said clutch base plate;

an idler gear connected for simultaneous rotation with said inner gear; and

a wheel gear having a friction surface for frictionally engaging said idler gear so that said wheel gear is rotatable with said idler gear, said friction surface being provided with a number of grooves that extend parallel to the axis thereof, both said idler gear and said wheel gear being located between said clutch plate and said clutch base plate.

4,566,345

TOOL CARRIER ASSEMBLY

Kenneth W. Erikson, 73 Spaulding Dr., Merrimack, N.H. 03054, and Keith W. Erikson, 7 Quarry Circle Dr., Milford, N.H. 03055

Filed Jul. 23, 1984, Ser. No. 633,338

Int. Cl.⁴ F16C *33/20*

U.S. Cl. 74—89.15 **2 Claims**

1. A tool carrier assembly comprising: a carrier supporting a tool for reciprocating motion;

guide rails;

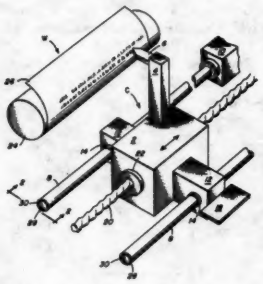
means for reciprocating the carrier along the guide rails;

the guide rails comprising a core of metal rod stock with a sheath of plastic material surrounding the core,

the sheath having a ground surface;

sleeve bearings on the carrier engageable with the guide rails;

the plastic sheath being made of extruded nylon containing approximately 20% of polytetrafluoroethylene,



the bearings being made of molded acetyl copolymer containing approximately 20% of polytetrafluorethylene.

4,566,346

AUTOMATED TOOL MANIPULATING STRUCTURE WITH X-Y MOVEMENT INCLUDING A BELT AND PULLEY DRIVE ARRANGEMENT

Maurice R. Petiteau, 7, rue Sancey, F-25000 Besancon, France

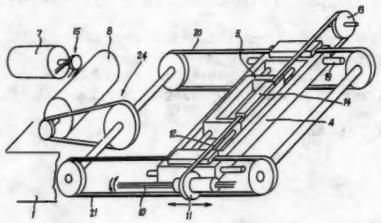
PCT No. PCT/FR82/00041, § 371 Date Nov. 8, 1982, § 102(e) Date Nov. 8, 1982, PCT Pub. No. WO82/03044, PCT Pub. Date Sep. 16, 1982

PCT Filed Mar. 9, 1982, Ser. No. 441,532

Claims priority, application France, Mar. 10, 1981, 81 04747

Int. Cl.⁴ B25J *11/00*; F16H *19/06*

U.S. Cl. 74—89.22 **6 Claims**



1. An automated tool manipulating structure comprising:

a support means;

a first frame mounted on said supported means, said first frame slides in its plane along a first axis F_1;

a first means for actuating said first frame, said first means for actuating being affixed to said support means and said first frame;

a second frame mounted inside said first frame, said second frame slides in its plane along a second axis F_2, said second axis F_2 is perpendicular to said first axis F_1 and said plane of said first frame and said plane of said second frame are parallel; and

a second means for actuating said second frame, said second means for actuating being affixed to said support means and said second frame, said second actuating means includes:

a rotating shaft extended parallel to said first axis F_1;

a pulley slidably mounted on said rotatable shaft; and

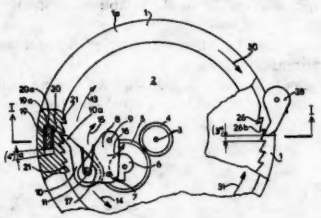
a belt operated by said pulley.

4,566,347

PROGRAMMER

Francis Thomas, Cluses, France, assignor to Societe Industrielle de Bellevaux, SIBEL, Cluses, France

Filed Jul. 18, 1984, Ser. No. 631,860
Claims priority, application France, Jul. 19, 1983, 83 12502
Int. Cl.[4] F16H *29/12;* H01H *43/10*
U.S. Cl. 74—125 4 Claims



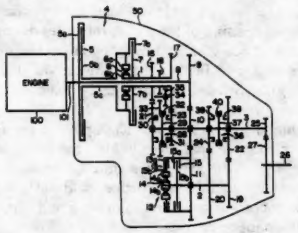
1. A programmer comprising a programme cam unit, means for rotating said cam unit manually in a first direction comprising a manually rotatable control shaft, means for resiliently positioning said control shaft, as it is rotated, in successive stable angular positions spaced apart by the angular value of one step, while passing in each instance through an intermediate limiting unstable angular position and thereafter bringing said control shaft resiliently from a limiting unstable angular position to the next stable angular position, automatic drive means for rotating said cam unit step by step in said first direction and means for connecting said cam unit to rotate with said control shaft with an angular clearance which is less than the angle through which the control shaft travels between one of its stable angular positions and the limiting unstable intermediate angular position which follows.

4,566,348

TRANSMISSION WITH DRIVEN SHAFT AND TWO CLUTCHING DEVICES AT THE SAME ENDS OF TWO PARALLEL DRIVING SHAFTS

Teruo Akashi; Hiroshi Ito, and Shigemichi Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 1, 1983, Ser. No. 470,941
Claims priority, application Japan, Jun. 18, 1982, 57-104731
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—359 6 Claims



1. A transmission mechanism for a vehicle, for receiving input of rotational power from a power supplying member which rotates in a particular rotational direction and for outputting rotational power to a power receiving member, comprising:

a rotatable input member connected to said power supply member and which receives a supply of said rotational power from said power supplying member;

a first driving gear wheel shaft;

a second driving gear wheel shaft mounted generally parallel to said first driving gear wheel shaft;

a driven gear wheel shaft mounted generally parallel to said first and second driving gear wheel shafts, said driven gear wheel shaft being rotationally connected to said power receiving member;

a first pair of gear wheels, one of which is fixedly mounted one one of said first driving gear wheel shaft and said driven gear wheel shaft and the other of which is rotatably mounted on the other of said first driving gear wheel shaft and said driven gear wheel shaft and which are in a mutually geared power transmitting relationship, so as to provide a first reduction gear ratio from said first driving gear wheel shaft to said driven gear wheel shaft;

a second pair of gear wheels, one of which is fixedly mounted on one of said second driving gear wheel shaft and said driven gear wheel shaft and the other of which is rotatably mounted on the other of said second driving gear wheel shaft and said driven gear wheel shaft and which are in a mutually geared power transmitting relationship, so as to provide a second reduction gear ratio smaller than said first reduction gear ratio from said second driving gear wheel shaft to said driven gear wheel shaft;

a third pair of gear wheels, one of which is fixedly mounted on one of said first driving gear wheel shaft and said driven gear wheel shaft and the other of which is rotatably mounted on the other of said first driving gear wheel shaft and said gear wheel shaft and which are in a mutually geared power transmitting relationship, so as to provide a third reduction gear ratio smaller than said second reduction gear ratio, one of said third pair of gear wheels being fixedly mounted on its said shaft which is the same shaft as the one on which one of said first pair of gear wheels is fixedly mounted, and the other of said third pair of gear wheels being rotatably mounted on its said shaft which is the same shaft as the one on which one of said first pair of gear wheels is rotatably mounted;

a fourth pair of gear wheels, one of which is fixedly mounted on one of said driving gear wheel shaft and said driven gear wheel shaft and the other of which is rotatably mounted on the other of said second driving gear wheel shaft and said driven gear wheel shaft and which are in a mutually geared power transmitting relationship, so as to provide a fourth reduction gear ratio from said second driving gear wheel shaft to said driven gear wheel shaft, one of said fourth pair of gear wheels being fixedly mounted on said shaft which is the same shaft as the one on which one of said second pair of gear wheels is fixedly mounted, and the other of said fourth pair of gears wheels being rotatably mounted on said shaft which is the same shaft as the one on which one of said second pair of gear wheels is rotatably mounted;

a first synchromesh device which engages said rotatably mounted one of said first pair of gear wheels with said shaft on which it is thus rotatably mounted when said first synchromesh device is shifted to one side of a neutral position thereof and which engages said rotatably mounted one of said third pair of gear wheels with said shaft on which it is thus rotatably mounted when said first synchromesh device is shifted to the other side of a neutral position thereof opposite to said one side;

a second synchromesh device which engages said rotatably mounted one of said second pair of gear wheels with said shaft on which it is thus rotatably mounted when said second synchromesh device is shifted to one side of a neutral position thereof and which engages said rotatably mounted one of said fourth pair of gear wheels with said shaft on which it is thus rotatably mounted when said second synchromesh device is shifted to the other side of a neutral position thereof opposite to said one side;

a first clutching device comprising a rotational power input member and a rotational power output member, mounted

proximate to an end of said first driving gear wheel shaft that is closest to said input member with its rotational power output member rotationally coupled to said first driving gear wheel shaft, which according to selective control thereof is able selectively either to disengage said first driving gear wheel shaft with said input member in either relative rotational direction or to couple said first driving gear wheel shaft to said input member in one relative rotational direction only, said one relative rotational direction being the one in which rotational power is required to be transmitted through said first clutching device in order to rotationally power said first driving gear wheel shaft from said power supplying member via said input member and said first clutching device when said power supplying member is being rotated in said particular rotational direction;

a second clutching device comprising a rotational power input member and a rotational power output member, mounted proximate to an end of said second driving gear wheel shaft that is closest to said input member with its rotational power output member rotationally coupled to said second driving gear wheel shaft, which according to selective control thereof is able selectively either to disengage said second driving gear wheel shaft with said input member in either relative rotational direction, or to couple said second driving gear wheel shaft to said input member in one relative rotational direction only, said one relative rotational direction being the one in which rotational power is required to be transmitted through said second clutching device in order to rotationally power said second driving gear wheel shaft from said power supplying member via said input member and said second clutching device when said power supplying member is being rotated in said particular rotational direction;

one of said rotational power input members of said first and second clutching devices being coaxially rotationally coupled to said input member; and

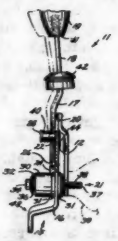
rotational power transfer means which includes a first power transfer gear wheel coaxially rotationally coupled to said one of said rotational power input members of said first and second clutching devices, a second power transfer gear wheel coaxially rotationally coupled to the other of said rotational power input members of said first and second clutching devices, and an intermediate power transfer gear wheel rotatably mounted on said driven gear wheel shaft and meshed with said first and second power transfer gear wheels.

4,566,349

CHATTERLESS SHIFTER

Dwain Van der Loon, Wyoming, and Gary Curths, Grandville, both of Mich., assignors to Alofs Manufacturing Company, Grand Rapids, Mich.

Filed Oct. 6, 1983, Ser. No. 539,697
Int. Cl.[4] B60K *20/02, 20/00*
U.S. Cl. 74—475 **4 Claims**



1. A chatterless shifter combination comprising:

a stamped metal index plate having arcuately disposed notches on the upper edge thereof and stop means for each;

a stamped metal shifter bracket pivotally connected to said index plate by means of a tubular swage-connected buffered insulating bushing and stud attached to said shifter bracket;

a stamped metal shifter extension having a tab extension to operably engage said index plate and nestable in said shifter bracket and limitedly tiltable against said shifter bracket;

an insulating mat between said shifter bracket and said shifter extension; and

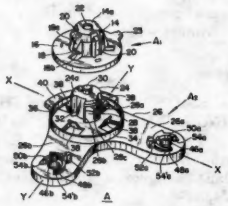
means urging said shifter extension into nesting contact in said shifter bracket and into normal selected engagement of said tab with said index plate.

4,566,350

LEVER ASSEMBLY

Issei Miyamoto, Yokohama, and Yuichi Kato, Tokyo, both of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,624
Claims priority, application Japan, Jan. 27, 1983, 58-9081[U]; Oct. 15, 1983, 58-159577[U]; Oct. 15, 1983, 58-159578[U]
Int. Cl.[4] G05G *1/04;* F16C *11/00*
U.S. Cl. 74—526 **22 Claims**



1. A lever assembly mounted on a panel for linking driving and driven device through connecting rods, comprising:

a lever holder which includes a tubular portion inserted through an opening of the panel, the outer diameter of the lever holder being substantially equal to the diameter of said opening, and further including an annular base portion integral with and concentrically disposed on an open end of said tubular portion;

a lever which includes a hollow shaft portion inserted in said tubular portion of said lever holder, the outer diameter of said hollow shaft being substantially equal to the inner diameter of said tubular portion, and further including first and second arms linked to driving and driven devices through connecting rods;

first means for providing a locking connection between said tubular portion of said lever holder and the panel;

second means for providing a locking connection between said hollow shaft portion of said lever and said tubular portion of said lever holder while permitting rotation of said hollow shaft portion relative to said lever holder; and

third means for suppressing excess rotation of said hollow shaft portion of said lever relative to said tubular portion of said lever holder by contacting a portion of said lever with a portion of said lever holder.

4,566,351

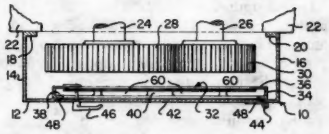
GEAR HOUSING DEVICE FOR PREVENTING OIL LEAKAGE

Eugen Skipor, Chicago, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 28,762, Apr. 9, 1979, abandoned. This application Oct. 13, 1983, Ser. No. 541,636

Int. Cl.[4] F16H *57/02*

U.S. Cl. 74—606 R **1 Claim**



1. An improved liquid tight housing for gears and the like comprising walls defining an enclosure for retaining a liquid gear lubricant therein, at least one of said walls having an outer surface, being vertical and having an access opening formed therein and a door for closing the access opening to prevent escape of lubricant contained within the housing, characterized in that the access opening is formed by a lip extending inwardly of said one wall at a right angle thereto and terminating at an inner end and extending completely about said opening, first and second spaced apart parallel flanges rigid with said lip and extending inwardly thereof at right angles thereto completely about said opening, said first flange being formed on the inner end of said lip and said second flange being disposed intermediate said first flange and the outer surface of said wall and forming a seat for said door, said first flange being of a width greater than the width of said second flange, said first and second flanges together with said lip forming a generally U-shaped groove for receiving lubricant, a baffle plate mounted on said door and spaced inwardly therefrom and the periphery thereof extending into said groove, there being a clearance between said baffle plate and said first flange to provide a passage for the flow of lubricant deposited on said baffle plate downwardly into said groove, and means provided in the portion of said U-shaped groove below said baffle plate to define openings permitting the flow of lubricant from the groove into said enclosure.

4,566,352

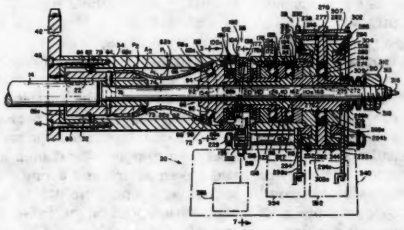
ROTARY SHAFT CONTROL APPARATUS

Bernard Stiff, 1350 Main St., Lynnfield, Mass. 01940

Division of Ser. No. 468,156, Feb. 22, 1983, which is a division of Ser. No. 268,840, Jun. 1, 1981, Pat. No. 4,382,391, which is a division of Ser. No. 965,236, Dec. 1, 1978, Pat. No. 4,286,476. This application Nov. 5, 1984, Ser. No. 669,637

Int. Cl.[4] F16H *37/02, 33/04*

U.S. Cl. 74—640 **8 Claims**



1. Torque coupling apparatus for use particularly for rotary shaft control comprising

A. a first bearing unit mounted for rotation about an axis, said first bearing unit having an array of bearing elements projecting out from both faces of said first bearing unit;

B. a second bearing unit mounted for rotation about said axis adjacent said first bearing unit, said second bearing unit having an array of bearing elements projecting out from both faces of said second bearing unit;

C. a first plate mounted for rotation about said axis adjacent said first bearing unit, said first plate being formed with a race in one face for engaging the bearing elements projecting out from one face of said first bearing unit;

D. a second plate mounted for rotation about said axis between said two bearing units, said second plate being formed with races in its opposite faces, one of said races receiving the bearing elements projecting out from the other face of said first bearing unit and the other of said races receiving the bearing elements projecting out from one face of said second bearing unit;

E. a third plate mounted for rotation about said axis adjacent said second bearing unit, said third plate being formed with a race in one face for receiving the bearing elements projecting out from the other face of said second bearing unit;

F. a tractive-type lubricant coating said bearing elements, said lubricant exhibiting a significant amount of shear strength when subjected to pressure,

G. means for axially loading the plates and bearing units together so as to exert pressure on the lubricant;

H. means for rotatively coupling the first and third rings together;

I. means for applying torque to the first and third rings;

J. torque take-off means coupled to the first bearing unit; and

K. means for rotating the second bearing unit relative to the first and second rings so as to control the rotary speed of the first bearing unit.

4,566,353

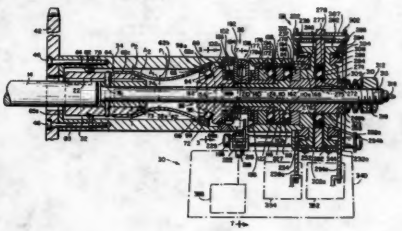
ROTARY SHAFT CONTROL APPARATUS

Bernard Stiff, 1350 Main St., Lynnfield, Mass. 01940

Division of Ser. No. 268,840, Jun. 1, 1981, Pat. No. 4,382,391, which is a division of Ser. No. 965,236, Dec. 1, 1978, Pat. No. 4,286,476. This application Feb. 22, 1983, Ser. No. 468,156

Int. Cl.[4] F16H *1/44, 15/26;* **F16D** *13/00*

U.S. Cl. 74—710.5 **10 Claims**



1. Torque coupling apparatus for use particularly for rotary shaft control comprising

A. a rotary shaft for rotating in a given direction,

B. a rotary bearing unit rotatively fixed to said shaft and having an array of bearing elements projecting out from both faces of the bearing unit,

C. a first plate rotatively mounted on said shaft coaxially with respect to the bearing unit, said plate being formed with a race in one face thereof engaging the bearing elements projecting from one face of the bearing unit,

D. a second plate rotatively mounted on said shaft coaxialy with respect to the bearing unit, said second plate being formed with a second race in one face thereof engaging the bearing elements projecting out from the other face of the bearing unit,

E. torque take-off means rotatively mounted on said shaft and coupled to the second plate, said torque take-off means including rotary output means,

F. a tractive-type lubricant applied to the bearing elements, said lubricant exhibiting significant shear strength when subjected to a selected pressure,

G. means on said shaft for axially loading the plates against the bearing unit so as to exert said selected pressure so that torque may be coupled between the bearing unit and the plates,

H. means for slowing or stopping the rotation of said first plate when said shaft is rotating in said given direction whereby the output means are advanced in phase relative to said shaft, and

I. means for slowing or stopping the rotation of the second plate when said shaft is rotating in said given direction whereby said output means are retarded in phase relative to said shaft.

4,566,354

METHOD AND APPARATUS FOR CONTROLLING REDUCTION RATIO OF CONTINUOUSLY VARIABLE TRANSMISSION WITH ENGINE COOLANT TEMPERATURE COMPENSATION

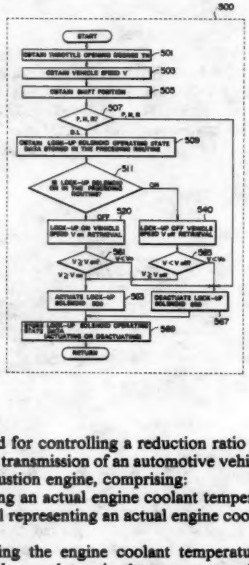
Haruyoshi Kumura, Yokohama; Keiju Abo, Yokosuka; Yoshikazu Tanaka, Yokohama; Hiroyuki Hirano, Yokosuka; Sigeaki Yamamuro, Zushi, and Yoshiro Morimoto, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 19, 1983, Ser. No. 486,331

Claims priority, application Japan, Apr. 19, 1982, 57-63867; May 20, 1982, 57-83928

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—866 **16 Claims**



1. A method for controlling a reduction ratio of a continuously variable transmission of an automotive vehicle having an internal combustion engine, comprising:

(a) generating an actual engine coolant temperature indicative signal representing an actual engine coolant temperature;

(b) comparing the engine coolant temperature indicative signal with a predetermined temperature value indicative signal representing a predetermined temperature value;

(c) detecting an operating condition under which the automotive vehicle is operating;

(d) generating a desired optimum reduction ratio indicative signal representing a desired optimum reduction ratio for the operating condition detected in said detecting step, the desired optimum reduction ratio indicative signal varying in a first pattern when the engine coolant temperature indicative signal is at least equal to said predetermined temperature value and in a second pattern when the engine coolant temperature indicative signal is less than the predetermined temperature value indicative signal, said second pattern giving a desired optimum reduction ratio larger than a desired optimum reduction ratio given by the first pattern for the same operating condition detected in said detecting step;

(e) adjusting the actual reduction ratio of the continuously variable transmission toward a value which agrees with the desired optimum reduction ratio; and

(f) repeating the steps (a), (b), (c), (d) and (e) until the actual reduction ratio agrees with said desired optimum reduction ratio, wherein the desired optimum reduction ratio given by the first pattern is determined based upon an operating variable indicative signal partly representing the operating condition detected in said detecting step, and the desired optimum reduction ratio given by the second pattern is determined based upon a corrected signal given by correcting said operating variable indicative signal by a predetermined value.

4,566,355

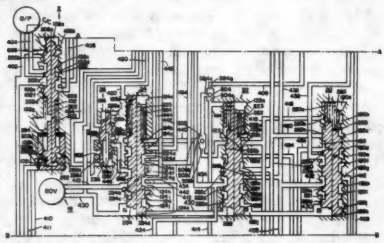
SHIFT VALVE FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 29, 1983, Ser. No. 518,746

Int. Cl.[4] B60K *41/16, 41/06*

U.S. Cl. 74—869 **3 Claims**



1. A hydraulic control system for an automatic transmission for a motor vehicle having an engine including a throttle which opens in degrees, the transmission being shiftable between a plurality of forward speed ratios the hydraulic control system comprising:

a source of fluid pressure;

means communicating with said source of fluid pressure for producing a governor fluid pressure variable with the vehicle speed;

means communicating with said source of fluid pressure for producing a throttle fluid pressure variable with the degree of throttle opening;

means for producing a downshift position hold signal fluid pressure;

a shift valve including means for defining a valve bore, a spool slidably disposed in said valve bore for movement between a downshift position and an upshift position and having at least one pressure acting area which is exposed to said governor fluid pressure, a plug having a pressure acting area which is exposed to said throttle fluid pressure, and a spring disposed between said spool and plug and acting therebetween, said governor pressure acting area, when acted upon by said governor pressure urging said spool to move from said downshift position thereof to said upshift position thereof against said spring, said throttle pressure acting area, when acted upon by said throttle fluid pressure, urging said plug to move said spool from said upshift position thereof to the downshift position thereof;

said spool having a first signal pressure acting area and said plug having a second signal pressure acting area;

said valve bore defining means being formed with a bias port opening into said valve bore, said bias port providing communication between said downshift position hold signal fluid pressure producing means and said first and second signal pressure acting areas so as to allow said downshift position hold signal fluid pressure to act upon said first and second signal pressure acting areas,

said first signal pressure acting area, when acted upon by said downshift position hold signal fluid pressure, urging said spool to move from said upshift position thereof to the downshift position thereof, said second signal pressure acting area, when acted upon by said downshift position hold signal fluid pressure urging said plug to move away from said spool

said valve bore opening means being formed with a first group of ports comprising first, second and third ports, and also with a second group of ports comprising fourth, fifth and sixth ports;

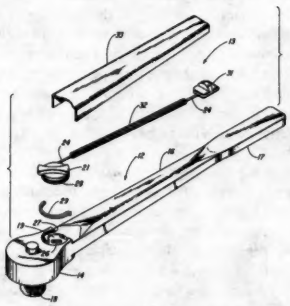
said spool being formed with axially spaced first, second and third control lands, said first and second control lands cooperating with said first group of ports to connect said second port selectively to said first or third port, said second and third control lands cooperating with said second group of ports to connect said fifth port selectively to said fourth or sixth port.

4,566,356

RATCHET WRENCH ASSEMBLY

Rosh N. Herota, Yuba City, Calif., assignor to Tom Tateyama and K & H Distributors, both of Woodland, Calif.

Filed Jun. 5, 1984, Ser. No. 617,492
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—62 **2 Claims**



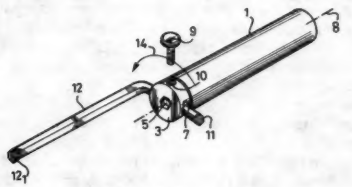
1. In a ratchet wrench having a shank with a face and side walls and with a handle at one end and a head at the other end and having in said head a socket stud adapted to rotate in either of two directions and having in said head means including a control knob movable into either of two positions in engagement with a pawl and ratchet means for correspondingly controlling the direction of rotation of said stud, the combination of a ratchet wrench assembly comprising a crank pin eccentrically mounted on and upstanding from said control knob, a sheet-like sheath in part clipped on said side walls of said shank and in part separated from said face of said shank to leave a space therebetween, a tubular shroud located within said space and confined against said shank face by said sheath, a thumb tab embracing one end of and slidably mounted on said sheath, a rod slidably mounted within said shroud, means at one end of said rod for securing said rod to said thumb tab, and means at the other end of said rod journalling the other end of said rod on said crank pin, wherein said thumb tab is for remotely and alternatively controlling the direction of rotation of said stud.

4,566,357

UNIVERSAL TOOL-HOLDER

Patricia Carossino, 16, Chemin Dupuis Vert, 95000 Cergy, France

Filed Dec. 23, 1983, Ser. No. 564,846
Claims priority, application France, Jan. 5, 1983, 83 00071
Int. Cl.[4] B25B *23/16*
U.S. Cl. 81—177.2 **9 Claims**



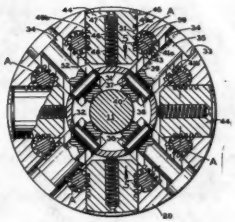
1. A universal tool holder for receiving and applying torque to a tool for tightening or untightening a screwable member, comprising a grip member defining an axial bore, a rotary head member secured axially to said grip member in said bore and freely rotatable about the axis of said grip member relative to said grip member without relative axial movement between said head and grip members, said head member presenting an axial aperture opening along the axis of said grip member and at least one radial aperture opening normal to the axis of said grip member, each of said apertures being adapted to receive alternatively a part of said tool, and locking means for releasably engaging said part of said tool in the aperture to secure the tool therein.

4,566,358

BAR STOCK GUIDE ARRANGEMENT FOR SCREW MACHINES

Paul Ducanis, 17401 NW. 2nd Ave., Miami, Fla. 33169

Filed Mar. 16, 1984, Ser. No. 590,347
Int. Cl.[4] B23B *15/00, 13/08*
U.S. Cl. 82—38 A **17 Claims**



1. In a bar stock guide arrangement at the inlet side of a screw machine, said guide arrangement comprising:

a plurality of rigid cross plates spaced apart at intervals along the path of the bar stock at the inlet side of the screw machine and having substantially horizontal openings therethrough for passing the bar stock;

a plurality of annular fittings defining a longitudinal passageway for the bar stock;

means rotatably mounting each fitting in a corresponding cross plate at said opening therein for permitting the fitting to rotate in unison with the bar stock when the bar stock is rotated by the screw machine;

and a plurality of rollers mounted in each fitting at circumferentially spaced locations around said longitudinal passageway for rolling engagement with the bar stock at different circumferential locations thereon;

the improvement which comprises:

a plurality of weights slidably mounted in each fitting at circumferentially spaced locations around said longitudinal passageway for the bar stock to be urged laterally outward by centrifugal force as said fitting rotates;

means acting between said weights and said rollers to hold the rollers laterally inward against the bar stock in response to the urging of said weights outward by centrifugal force;

each of said weights being positioned between a pair of said rollers circumferentially around said longitudinal passageway for the bar stock;

and said means acting between said weights and said rollers comprising:

a holder for each roller slidably mounted in the corresponding fitting for movement laterally of said longitudinal passageway and having rack teeth on its opposite sides circumferentially around said longitudinal passageway;

rack teeth on the opposite sides of each of said weights circumferentially around said longitudinal passageway;

and respective pinion gears engaged between said holders and the neighboring weights and meshing with the rack teeth thereon to force said holders inward when centrifugal force urges said weights outward.

4,566,359

METHOD OF STACKING FINS OF HEAT EXCHANGERS

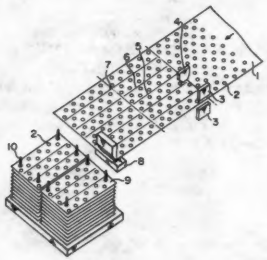
Masahiro Miyagi; Katsuharu Uehara; Yoshio Nozawa, and Takahiko Deguchi, all of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,237

Claims priority, application Japan, Feb. 16, 1983, 58-22777

Int. Cl.⁴ B26D *9/00, 7/00;* **B65H** *35/06*

U.S. Cl. 83—23 **4 Claims**



1. A method of producing and stacking fins of heat exchangers comprising the steps of:

forming in a strip of metal a multiplicity of apertures for inserting tubes therein;

cutting said strip of metal lengthwise to form a continuous line of cut extending from a leading edge of the strip to a trailing edge thereof, cutting a plurality of intermittent lines of cut disposed parallel to one another lengthwise of the strip while leaving uncut portions at opposite ends of the intermittent lines, said continuous line and intermittent lines being spaced apart widthwise of the strip by an interval corresponding to the width of fins to be produced as end products;

drawing said strip by suction to cause same to adhere to a suction plate;

cutting across said strip at points spaced apart lengthwise of said strip at the uncut portions of the intermittent lines of cut by a distance corresponding to the length of the fins to provide a multiplicity of groups of fins; and

forcing said apertures of the fins of each said group of fins onto stacking bars to stack one group of fins after another to provide a stack of the groups of fins.

4,566,360

CUTTING DEVICE FOR SHEETS WITH AT LEAST ONE ROTATING CUTTING KNIFE AND CONVEYER

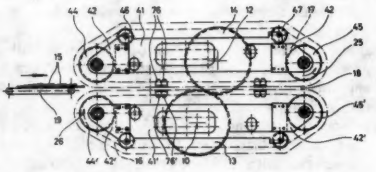
Gunthart Lehmann, Lautern, Fed. Rep. of Germany, assignor to Maschinenbau Oppenweiler GmbH, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,448

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244422

Int. Cl.⁴ B26D *7/06*

U.S. Cl. 83—409 **13 Claims**



1. A cutting device for folded and unfolded sheets, as well as booklets, with at least one rotating cutting knife and one conveyer which transports the material to be cut at least during the cutting process, said device comprising:

a first endless conveyer element which is pressed onto the material along a part of its length by spring pressure exerted on its side opposite the material to be cut,

a pressure device extending in the lengthwise direction of the conveyer, said pressure device including pressure pieces individually installed in the direction of the conveyer element, each pressure piece being spring loaded, independently from the others, and movable in a direction, perpendicular to a plane of the conveyer element as the conveyer element passes adjacent to the pressure device,

wherein each pressure piece is fixed laterally, relative to the running direction of the conveyer element;

wherein each pressure piece is installed in a manner allowing it to swivel around an axis extending crosswise to the running direction of the conveyer element;

further comprising a slit-plug connection for connecting each pressure piece to a support on a frame, wherein the slit extends in the direction of the pressure and at least one pre-stressed spring is supported in the running direction of the conveyer element on each side of the slit-plug connection by the pressure piece on the one hand, and by the support on the other hand;

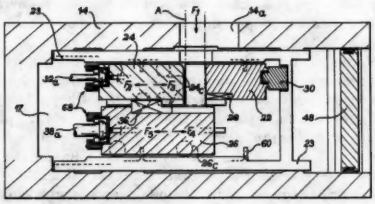
further comprising a second endless conveyer element, one from above and the other from below, which presses onto the material by means of the pressure devices, and which are arranged facing each other with the material between them, in order to form a clamping gap;

wherein each endless conveyer element has an endless roller chain which has plugs that protrude on both sides, and that in the area of the pressure pieces there are two guide rails mounted firmly to the frame, which receive these plugs, whereby each rail has a guide slit, the lower delineating lateral side surface of the slit, located closest to the material to be cut, determines the shortest distance from the material to be cut for the plugs extending into them, while the upper delineating surface determines the largest distance.

4,566,361
APPARATUS FOR SHEARING IRRADIATED FUEL ASSEMBLIES

René Dubost, Saint Gervois; Robert Fiori, Connaux, and Philippe Seyfried, Bagnols sur Ceze, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 16, 1983, Ser. No. 494,932
Claims priority, application France, May 18, 1982, 82 08701
Int. Cl.⁴ B23D *23/00*; B26D *7/02*
U.S. Cl. 83—454 **4 Claims**

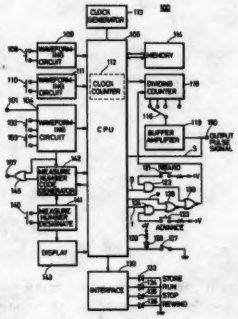


1. An apparatus for shearing irradiated fuel assemblies, comprising a confinement cell, provided with a supporting member for supporting at least one fixed counterblade, at least one side-clamping carriage adapted to engage an assembly to be sheared by the counterblade and at least one blade holder carriage adapted to move in a direction perpendicular to said counterblade in order to shear said assembly, the counterblade being mounted on a counterblade carriage which normally bears against a detachable member, the counterblade carriage, the side-clamping carriage and the blade holder carriage being arranged on rails disposed in a direction perpendicular to the counterblade, an intervention cell, said confinement cell communicating with said intervention cell by a passage normally sealed by a cover, said rails being extendable into said intervention cell within said passage, the dimensions of said passage being sufficient to permit the carriages to travel in said intervention cell when said detachable member and said cover are removed.

4,566,362
SYNCHRONIZING SIGNAL GENERATOR

Tadao Kikumoto, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Jul. 10, 1984, Ser. No. 629,561
Claims priority, application Japan, Jul. 14, 1983, 58-110067[U]
Int. Cl.⁴ G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**

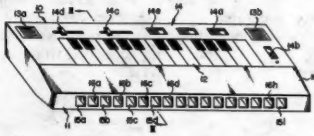


1. A synchronizing signal generator comprising: code signal generating means for generating a code signal representing a position on the score of a musical piece in response to a manually entered instruction, said code signal generating means comprising position designating means for designating an absolute position on said score; and for producing a code signal representing said absolute position on said score as designated by said designating means for starting a synchronous performance from any arbitrarily selected position of a musical piece; said signal generator further comprising clock signal generating means for generating clock signals; counting means connected to an output terminal of said code signal generating means and to an output terminal of said clock signal generating means, by which an interval of application of the code signals is measured based on the clock signals from said clock signal generating means in response to application of the code signals from said code signal generating means; calculating means connected to an output terminal of said counting means for making a calculation based on a count output from said counting means and a predetermined calculation formula in response to an application of said count output; storage means connected to an output terminal of said calculating means for storing the result of said calculation in response to said calculation by said calculating means; and synchronizing signal output means connected to the output terminal of said calculating means for providing synchronizing signals based on the fact that said counting means counts the number of clock signals corresponding to the result of said calculation, in response to the fact that said calculating means reads the result of said calculation from said storage means.

4,566,363
ELECTRONIC MUSICAL INSTRUMENT

Yoneaki Arai, Chichibu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,121
Claims priority, application Japan, Mar. 2, 1983, 58-28908[U]; Dec. 27, 1983, 58-246814
Int. Cl.⁴ G10H *1/34, 1/46*
U.S. Cl. 84—1.08 **13 Claims**



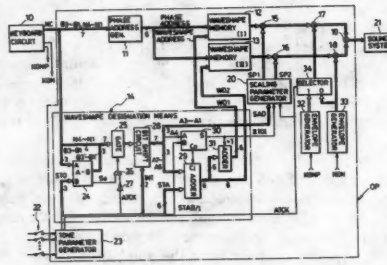
1. An electronic musical instrument, comprising:
a case;
a plurality of sound holes arranged in the case;
openings formed individually in the walls of the sound holes;
elastic members of an elastic material closing the openings and adapted to be deformed in accordance with the change of the pressure inside the sound holes caused by exhalation or inhalation;
contact mechanisms disposed outside the sound holes and having contacts operatively coupled to the elastic members and adapted to be driven in accordance with the deformation of the elastic members;
input signal generating means connected to the contact mechanisms for generating input signals in accordance with the drive of the contacts;
musical sound producing means contained in the case for producing musical sounds in accordance with the input signals;
a power source in the case for supplying electric power to at least said musical sound producing means; and
volume control means for collecting air flowing through said plurality of sound holes in one communicating passage formed in said case, and for controlling the volume of the musical sounds in accordance with the flow quantity of the collected air through said communicating passage.

4,566,364

ELECTRONIC MUSICAL INSTRUMENT CONTROLLING A TONE WAVESHAPE BY KEY SCALING

Mitsumi Katoh, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 12, 1984, Ser. No. 619,839
Claims priority, application Japan, Jun. 14, 1983, 58-104949; Jun. 14, 1983, 58-104950
Int. Cl.[4] G10H *1/02*
U.S. Cl. 84—1.19 13 Claims



1. An electronic musical instrument comprising:

tone pitch designation means for designating the tone pitch of a tone to be generated;

plural tone generation channels associated with a single generated tone, each of the channels including a respective means for generating a waveshape signal selectable from among waveshape signals of plural kinds;

waveshape designation means for designating which of said plural selectable waveshape signals is to be selectively generated in each of said respective waveshape generating means associated with the respective tone generation channels in accordance with the tone pitch designated by said tone pitch designation means; and

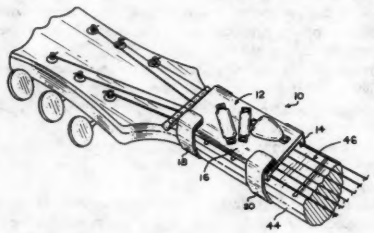
weighting means for weighting the waveshape signals selectively generated by the respective channel associated waveshape generating means in response to said designation, said single tone being generated from said weighted selectively generated waveshape signals.

4,566,365

CHORD PLAYING ATTACHMENT FOR STRINGED MUSICAL INSTRUMENTS

Roy E. Huston, Jr., 2 Alkaid St. NW., Rome, Ga. 30161

Filed Oct. 5, 1984, Ser. No. 658,358
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—317 1 Claim



1. A chord playing attachment for musical instruments having a neck and a plurality of strings associated with said neck, said attachment comprising:

an L shaped base having a shorter leg adapted to abut a first side portion of said neck and a longer leg adapted to overlie said plurality of strings and said neck, said base being provided with spacer means to space said longer leg from said neck and said strings, said spacer means including at least one spacer attached to a lower surface of said longer leg of said base which extends between an adjacent pair of said strings to contact said neck;

strap means having one end attached to said shorter leg, said strap means being adapted to encircle said neck such that said second end may attach to said longer leg, said strap means including a pair of straps, each having a first end attached to said shorter leg and each having a first cooperating member attached to a second end for engagement with a second cooperating member attached to said longer leg;

a plurality of pushbutton assemblies supported by said longer leg, each pushbutton assembly having a distinctly colored pushbutton and three fingers coupled to said pushbutton and extending through said longer leg of said base to a position overlying three individual strings, said pushbutton being biased away from said longer leg such that pressing said pushbutton causes said fingers to press said strings against said neck and releasing said pushbutton allows said fingers to disengage from said strings, wherein each of said pushbutton assemblies includes a pair of spaced apart guide members attached to said longer leg and provided with stops proximate their upper ends, a support member vertically guided by said guide members, said fingers extending downwardly from said support member, and means biasing said support member towards said stops of said guide members, and wherein each of said pushbutton assemblies further includes an arcuate leaf spring abutting an upper surface of said support member, and a flexible, colored material covering said leaf spring; and

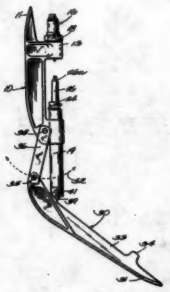
sheet music including a sequential pattern of colored indicia corresponding to a particular musical chord, said colored indicia indicating which of said colored pushbuttons should be pushed for a particular musical composition, said sheet music further including lyrics associated with said colored indicia such that the proper chords for words within said lyrics are indicated by said colored indicia.

4,566,366

HAND HELD CARTRIDGE RELOADING PRESS

Richard J. Lee, 3146 Kettle Moraine, Hartford, Wis. 53027

Filed Sep. 7, 1984, Ser. No. 648,307
Int. Cl.[4] F42B *33/10, 33/04*
U.S. Cl. 86—24 1 Claim



1. A hand held cartridge case reloading press comprising:

a first elongated handle body having nominally upper and lower ends, said body having a first laterally extending member at its lower end and a second laterally extending member intermediate of said first member and said upper end, said second member having a bore containing a female thread for receiving a mating male thread $\frac{1}{4}$ of an inch in

diameter and 14 threads per inch on a standard die element for performing operations on a cartridge case, said first member having a bore coaxial with the bore in said second member whose axis is juxtaposed to said first handle body,

a reciprocable ram extending through the bore in said first laterally extending member, said ram having means at an end above said first member to retain a shell holder and having a lower end below said first laterally extending member;

a second elongated handle body having nominally upper and lower ends and means pivotally connecting said second elongated handle body to said lower end of the ram at a place on said handle body spaced from its lower end,

link means having a first pivotal connection to the lower end of said first handle body offset laterally from said ram and a second pivotal connection to the lower end of said second handle body such that said second handle body pivots on said second pivotal connection for permitting said handle bodies to be swung toward and away from each other to thereby reciprocate said ram, and

a stop element projecting from said second handle body for striking said second laterally extending member to thereby limit the swing of one handle body toward the other so that a safe mechanical advantage can not be exceeded.

4,566,367

UNDERWATER WEAPON SYSTEMS

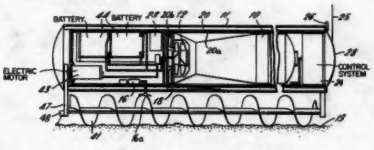
Christopher D. D. Hickey, Haywards Heath, United Kingdom, assignor to Underwater Storage Limited, Sussex, United Kingdom

Filed Dec. 8, 1983, Ser. No. 559,275

Claims priority, application United Kingdom, Dec. 10, 1982, 8235284

Int. Cl.⁴ F42B *22/00*; F41F *3/08, 3/10*

U.S. Cl. 89—1.810 **14 Claims**



1. An underwater weapon system comprising a self-propelled weapon, an elongate container for the weapon, ejection means for expelling the weapon from the container and a rotary material displacing means disposed along the length of the container to form the lower part of the system when the container is disposed horizontally, said material displacing means being arranged for cutting into and displacing material on the sea bed underneath the container.

4,566,368

LEAK DETECTOR FOR SEAL RING OF GUN BREECH MECHANISM

Rolf Bartolles, Korschenbroich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,552

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322437

Int. Cl.⁴ F41F *11/00*

U.S. Cl. 89—26 **10 Claims**

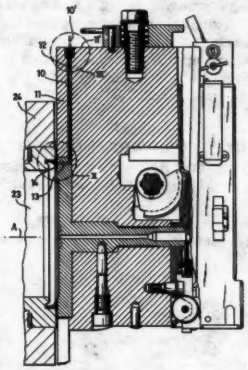
1. In a gun breech mechanism having:

a barrel formed with a backwardly open shell chamber,

a breech block displaceable into a position rearwardly closing the chamber, and

a seal ring between the block and the barrel and having an inner face exposed in the chamber and an outer face lying against the block and barrel, the improvement comprising:

means including a passage opening at the outer seal-ring face for detecting thereat a gas pressure in excess of a predeter-



mined superatmospheric pressure and for generating an alarm signal when such excess pressure is detected.

4,566,369

LOADING TRAY MECHANISM FOR A TANK CANNON

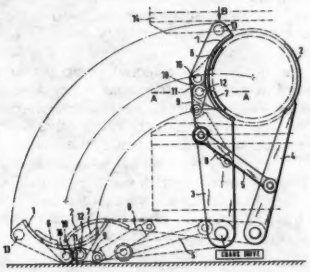
Adolf P. Bierwirth, Kaarst, and Erich Zielinski, Haan, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,534

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3306935

Int. Cl.⁴ F41F *9/06*

U.S. Cl. 89—45 **6 Claims**



1. An improved loading tray mechanism for loading a cartridge into a gun barrel of a weapon which is pivotally mounted in said weapon so as to be operatively pivotally movable between a first loading position in alignment with the recoil path of the gun barrel and a second firing position angularly removed from said first position in which said loading tray mechanism is not in said recoil path, the improvement comprising

said loading tray mechanism including a first lower loading tray, a first pivot arm pivotally supporting said first loading tray at one of its ends and being pivotally mounted on a non-recoiling part of said weapon at the other of its ends, said first pivot arm pivoting transversely with respect to the longitudinal axis of the gun barrel,

a second upper loading tray, a second pivot arm being fixedly connected to said second loading tray at one of its ends and being pivotally connected on a non-recoiling part of said weapon at the other of its ends, said second

pivot arm also pivoting transversely with respect to the longitudinal axis of the gun barrel,

said lower tray and upper second tray when in said first loadng position jointly defining a gun barrel quasi extension having an internal diameter which corresponds to the exterior diameter of the cartridge bottom, and

said lower first and upper second trays when in said second firing position folding into each other.

4,566,370
PISTON PUMP ARRANGEMENT

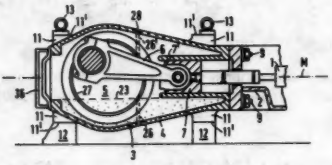
Nabil Hanafi, Urach, Fed. Rep. of Germany, assignor to Uraca Pumpenfabrik GmbH & Co. KG, Uraca, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,486

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301380

Int. Cl.⁴ F04B *21/00*

U.S. Cl. 92—59 **17 Claims**



1. Piston pump arrangement comprising:

a crank drive housing having a top half and a bottom half relative to a horizontal plane extending through the housing;

a crank drive shaft rotatably supported in said crank drive housing;

a drive coupling connection means at one end face of the crank drive shaft for accommodating a driving connection to a motor or the like to rotatably drive the crank drive shaft; and

at least one horizontally disposed pump piston drivingly connected to said crank drive shaft to reciprocate along a pump piston axis which extends substantially perpendicular to the rotational axis of the crank drive shaft;

wherein the top and bottom halves of the crank drive housing are functionally symmetrical so as to allow the crank drive housing to be inverted, and the top half to serve as the bottom half, and vice versa, to convert the piston pump from a right hand drive to a left hand drive.

4,566,371
VARIABLE PNEUMATIC PRESSURE FORCE-TRANSMITTING MECHANISM

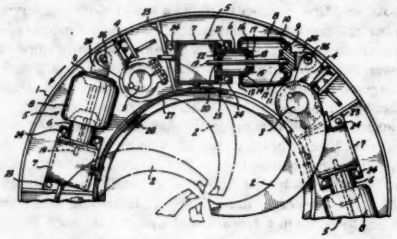
Ray B. Jorgensen, and Robert T. Ackerman, both of Seattle, Wash., assignors to Nicholson Manufacturing Company, Seattle, Wash.

Filed Nov. 29, 1982, Ser. No. 444,955

Int. Cl.⁴ F01B *19/04*; B27L *1/00*

U.S. Cl. 92—92 **4 Claims**

1. Variable pneumatic pressure force-transmitting mechanism comprising a force-transmitting member, pivot means mounting said force-transmitting member for arcuate movement, a closed composite pneumatic chamber including a reciprocable head pivotally connected to said force-transmitting member, a rigid pneumatic chamber section remote from said reciprocable head and a contractable and extensible pneumatic chamber section connected between said rigid pneumatic chamber section and said reciprocable head in communication with said rigid pneumatic chamber section, and attitude control means including a cantilever stem carried by said head, housed entirely within said closed composite pneumatic chamber, which does not pierce the wall of said closed composite pneumatic chamber, said stem extending through the interior of said contractable and extensible pneumatic chamber section from said reciprocable head into said rigid pneumatic chamber section and guiding said reciprocable head for limiting tilting relative to said rigid pneumatic chamber section as the spacing



between said reciprocable head and said rigid pneumatic chamber section decreases during contraction of said contractable and extensible pneumatic chamber section and arcuate movement of said force-transmitting member about said pivot means.

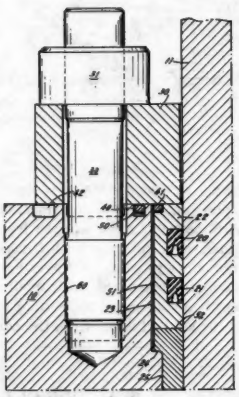
4,566,372
PRESSURE SEAL FOR ULTRA-HIGH PRESSURE APPARATUS

Adam Zandel, Forest Hills, and Alexander Zeitlin, White Plains, both of N.Y., assignors to A. Zeitlin & Associates, Mamaroneck, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,426

Int. Cl.⁴ F16J *15/18*

U.S. Cl. 92—168 **8 Claims**



1. A compensated seal structure for high pressure hydraulic apparatus which employs a high pressure fluid having a pressure of greater than about 10,000 pounds per square inch and a cylindrical ram having a smooth, elongated, outer surface having a diameter greater than about 100 inches; said hydraulic apparatus comprising said cylindrical ram, a main cylinder which receives said ram in sliding relation and means to apply high pressure fluid to the interior of said main cylinder and to an end of said ram to cause said ram to move along its axis relative to said main cylinder, the exterior diameter of said ram being less than the interior diameter of said main cylinder; said compensated seal structure comprising a seal holder cylinder having seal means fixed to its interior surface; said main cylinder having a constant interior diameter, interrupted by an

increased interior diameter section; said interior diameter section being disposed adjacent one of the ends of said main cylinder and being removed from the other of its ends; said seal holder cylinder disposed within said increased diameter section of said main cylinder and being retained between a shoulder which defines one end of said increased diameter section and a gland ring whereby said seal holder is fixed against tilting with respect to said main cylinder; the interior diameter of said seal holder cylinder being approximately equal to said constant interior diameter of said main cylinder, and being approximately equal to said outer diameter of said ram whereby said seal means sealably engages said outer surface of said ram; the outer diameter of said seal holder cylinder being spaced from said interior diameter of said main cylinder, thereby to define a thin annular chamber of predetermined uniform gap size surrounding said seal holder cylinder; and fluid paths for said seal holder cylinder which communicate between its inner and outer diameters whereby said high pressure fluid acting on said ram is applied to said annular chamber and reduces the differential force across the wall thickness of said seal holder cylinder when said main cylinder is pressurized.

4,566,373

VENTILATION ARRANGEMENT FOR AUTOMOTIVE VEHICLE OR THE LIKE

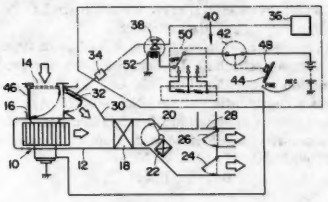
Toshio Ohashi, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 5, 1983, Ser. No. 557,883

Claims priority, application Japan, Dec. 7, 1982, 57-213427

Int. Cl.⁴ B60H *1/00*

U.S. Cl. 98—2.01 **5 Claims**



1. A ventilation arrangement for a vehicle having a cabin, comprising:

a duct leading to said cabin from a first opening through which fresh air from outside of the vehicle may be inducted;

a blower disposed in said duct for forcing air to flow toward said cabin when energized;

a passage which leads from said duct upstream of said blower and which merges with said duct downstream of said blower;

first means for controlling the flow of air through said passage;

a second opening in said duct upstream of said blower through which air from said cabin may be inducted;

a second means for selectively controlling the amount of air inducted through said first and second openings; and

control means for operating said first means to open said passage and permit air to flow therethrough when said blower is not energized and when said second means opens said first opening.

4,566,374

COFFEE MAKER

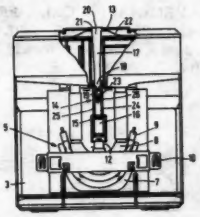
Pieter W. Medema, and Elmo I. Benjamins, both of Groningen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1984, Ser. No. 648,201

Claims priority, application Netherlands, Apr. 2, 1984, 8401032

Int. Cl.⁴ A47J *31/00*

U.S. Cl. 99—281 **2 Claims**



1. A coffee maker comprising a housing; a water tank supported by the housing; a filter device; a flow heater including a heating element for heating water from the water tank and feeding the same to the filter device, said flow heater being positioned within the housing; a thermal cut-out associated with the flow heater; an on/off indicator lamp situated adjacent the thermal cut-out; and means for actuating the thermal cut-out, said actuating means including an actuator button having an opening and an actuating arm made of a transparent material and serving as a light guide when the indicator lamp is on, one end of said actuating arm being located near the indicator lamp and the other end of said actuating arm projecting through the opening in the actuator button.

4,566,375

COVER CONSTRUCTION FOR A STEAM PEELING APPARATUS

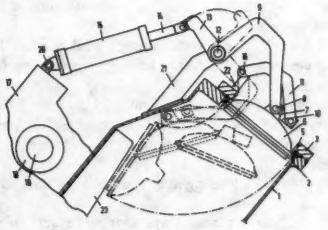
Peter W. C. van der Schoot, Groot Ammers, Netherlands, assignor to Goudsche Machinefabriek B.V., Gouda, Netherlands

Filed Nov. 9, 1984, Ser. No. 670,247

Claims priority, application Netherlands, Nov. 10, 1983, 8303867

Int. Cl.⁴ A23N *7/00*; B65D *43/14*

U.S. Cl. 99—348 **3 Claims**



1. In a steam peeling or boiling apparatus for crops, such as potatoes, carrots, celery, apples and the like, or for meat, comprising a substantially cylindrical peeling vessel arranged for rotation around horizontal stub shafts, having a supply and discharge opening disposed eccentrically or non-eccentrically in one of the end faces, said opening being closable by an inwardly movable cover and means for moving the cover between a closed position and an open position inside the vessel including a first lever rotatably connected at one end to

the cover and rotatably connected at the other to the exterior of the vessel, the improvement wherein the means for moving the cover further comprises a second operating lever connected to the cover and co-active with the first lever to displace the cover along the inner wall of the vessel during movement between the open and closed positions.

4,566,376

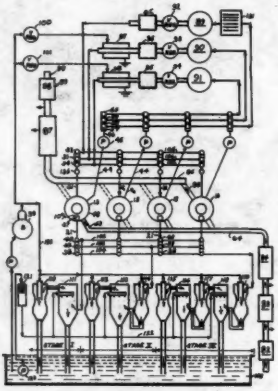
SYSTEM FOR PRODUCING CRISP FRUIT CHIPS

Wells A. Webb, 214½ E. Pine St., Lodi, Calif. 95240

Filed Jun. 8, 1984, Ser. No. 619,205

Int. Cl.⁴ A23L *1/212, 3/00*

U.S. Cl. 99—468 **11 Claims**



1. A system for dehydrating food particles comprising in combination:

a pressure vessel having an elongated vertically cylindrical chamber, particle inlet means for introducing particles into said chamber, and particle outlet means for removing particles from said chamber;

an elongated vertically oriented shaft rotatably mounted coaxially within said chamber, said shaft is vertically moveable;

a plurality of circular trays mounted in vertical spaced relation on said shaft for rotation therewith and for containing food particles;

means for selectively introducing a heat transfer liquid into said vessel for selectively heating and cooling food particles in said chamber;

means for evacuating said vessel and thereby establishing a pressure in said vessel below atmospheric pressure for enhancing the dehydration of food particles contained therein;

means defining a loading and an unloading zone adjacent the top of said vessel;

means for moving said trays along the axis of said shaft through said loading and unloading zones in a first direction for loading food particles onto said trays and in a second direction for unloading food particles from said trays;

cylindrical screen means surrounding said trays and mounted for rotation therewith and axially fixed within said vessel for confining food particles on said trays within a selected zone within said vessel; and

said system further comprises means for selectively moving said shaft for moving said trays through said respective zones.

4,566,377

APPARATUS FOR STORING AND VENTILATING CHEESES

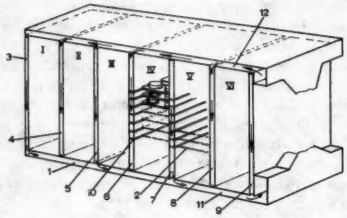
Arie J. van Buytene, Santpoort-Zuid, Netherlands, assignor to Esmil Hubert B.V., Sneek, Netherlands

Filed Jun. 25, 1984, Ser. No. 624,208

Claims priority, application Netherlands, Jun. 29, 1983, 8302305

Int. Cl.⁴ A01J *25/00, 25/16*

U.S. Cl. 99—474 **10 Claims**



1. Apparatus for storing and ventilating cheeses, having a plurality of shelves for supporting the cheeses, each said shelf having two opposite longitudinal ends, and two hollow side walls supporting said shelves respectively at said ends thereof so that the shelves are arranged vertically one above another, the hollow side walls having passages within them for supply and discharge of ventilating air to the spaces above the respective shelves, wherein each said shelf has at least one longitudinal extending duct for conducting ventilating air along the shelf, which duct is connected at one end of the shelf to a passage in the respective side wall and has, spaced longitudinally along the shelf, a plurality of openings for the ventilating air located at the underside of the shelf.

4,566,378

APPARATUS FOR HOOPING A FIBER BALE IN A FIBER BALE PRESS

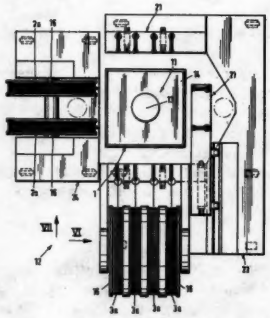
Gerold Fleissner, Egelsbach, Fed. Rep. of Germany, assignor to Vepa Aktiengesellschaft, Riehen/Basel, Switzerland

Continuation of Ser. No. 643,742, Aug. 21, 1984, abandoned, which is a continuation of Ser. No. 489,115, Apr. 27, 1983, abandoned. This application May 3, 1985, Ser. No. 730,249

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216883; Jul. 17, 1982, 3226832

Int. Cl.⁴ B65B *13/04*

U.S. Cl. 100—26 **7 Claims**



1. A fiber bale wire hooping apparatus for surrounding a fiber bale in a baling press with a metal wire the ends of which are held together by a crimped metal sleeve, comprising a

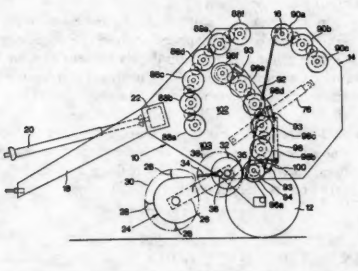
strapping mechanism including wire supply means (16) having wire feeding and tensioning means (17, 25) for supplying lengths of wire, wire guide means (21, 31, 41, 44) forming a guide channel along at least three sides around said fiber bale for guiding a length of wire around said fiber bale, wire end holding means (22) at an end of said guide channel for temporarily holding a forward free end of a wire, wire clamping and bending means (20) arranged downstream of said wire feeding and clamping means (17, 25) as viewed in a wire feed advance direction from said wire supply means (16) to said holding means, wire cutting means (18) arranged downstream of said feeding and tensioning means (17, 25) and upstream of said wire clamping and bending means (20) for cutting a wire after a wire has been first tensioned by said feeding and tensioning means (17, 25) and then clamped by said clamping and bending means (20), means (51) for automatically applying a metal sleeve (6) onto a cut end of a wire, means (19, 36, 35) for tilting said clamping and bending means (20) holding a wire end with a sleeve on said wire end toward said holding means (22), whereby a wire end protruding from said holding means is also inserted into said sleeve alongside said cut wire end, and means (70, 71) arranged for crimping said sleeve for tightly securing said wire ends to each other.

4,566,379

ROUND BALER WITH VERTICALLY ELONGATED STARTING CHAMBER

Frans J. G. C. Decoene, and Marc G. Vansteelant, both of Zedelgem, Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed May 18, 1984, Ser. No. 612,101
Int. Cl.[4] B30B *3/04*
U.S. Cl. 100—89 14 Claims



1. In a round baler having a base frame, a rear frame pivotally connected to said base frame, a first set of rollers rotatably mounted in fixed positions in said base frame and extending transversely of said base frame, the improvement comprising:

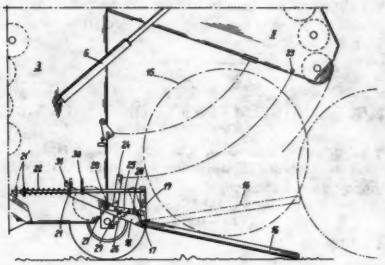
arm means pivoted on said rear frame for movement between a bale starting position and a full bale position, a second set of rollers rotatably carried on said arm means and extending transversely of said rear frame, said second set of rollers cooperating with only part of the rollers of said first set of rollers to define a bale starting chamber which is elongated in a generally vertical direction when said arm means is in said bale starting position, and said second set of rollers cooperating with all of the rollers of said first set of rollers to define a bale forming chamber which is generally cylindrical when said arm means is in said full bale position.

4,566,380

ROUND BALING PRESS FOR AGRICULTURAL PRODUCTS

Gerhard Clostermeyer, Gütersloh, and Werner Müller, Harsewinkel, both of Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 601,152
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314314
Int. Cl.[4] B30B *3/04, 15/32*
U.S. Cl. 100—89 8 Claims



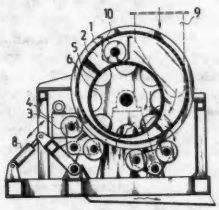
1. A round baling press for agricultural stalk products, comprising a housing forming a pressing chamber and including a stationary front housing part and a rear housing part turnable about a horizontal axis relative to said front housing part; a plurality of transporting elements arranged in said pressing chamber; hydraulic means arranged to move said rear housing part between a closed position in which it approaches said front housing part and closes said inner chamber, and a discharging position in which it is withdrawn from said front housing part and opens said inner chamber; and sensing means arranged to sense a free space between a discharged bale and a turning region of said rear housing part and releasing a switching step when the bale is at a sufficient distance from said housing, said sensing means including a check valve arranged in an oil circulation circuit of said hydraulic means, a pressure spring, a rod turnable in a discharge region of the finished bales by a rolling-out bale against the forces of said pressure spring, an abutment displaceable by said rod, and a switch actuated by said abutment for said check valve.

4,566,381

DRUM PRESS FOR SEPARATING LIQUID FROM SOLID SUBSTANCE

Matti J. Nikulainen, Pietarsaari, Finland, assignor to Kone Oy, Helsinki, Finland

Filed May 21, 1984, Ser. No. 612,243
Int. Cl.[4] B30B *9/20*
U.S. Cl. 100—121 5 Claims



1. A drum press for separating liquid from solid substance, said drum press comprising: an outer cylindrical perforated drum rotatable by a support means;

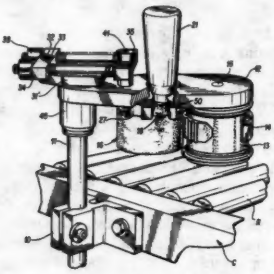
an inner perforated drum rotating within said outer drum and each drum rotating around different centers, so that between the envelope surfaces of the two drums a liquid is pressed out from the solid substance being pressed, said outer drum being provided with non-rotating end plates disposed with requisite clearance in relation to the rotating outer drum, wherein the inner drum is provided with a shaft and with end plates and a shell which passes through the non-rotating end plates of the outer drum with requisite clearance, the inner drum being provided in its shell and in its end plates fixed on the shaft with apertures towards the shell, through which apertures the liquid that has entered the inner drum during the solids substance pressing operation is enabled freely to flow out from the inner drum.

4,566,382

LINE CODER SYSTEM FOR USE ON EITHER SIDE OF CONVEYOR LINE

James C. Bronson, Lakeland, and Donald C. Wright, Jr., St. Petersburg, both of Fla., assignors to Lakeland Rubber Stamp Company, Inc., Lakeland, Fla.

Filed Feb. 13, 1985, Ser. No. 701,251
Int. Cl.[4] B41F *17/26*
U.S. Cl. 101—35 **5 Claims**



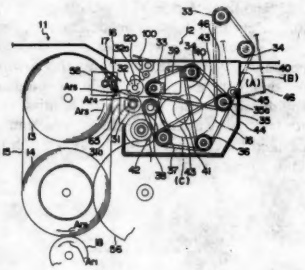
1. A marking device for use with a conveyor carrying successive containers past the device to apply markings to one or more surfaces of each of the successive containers, said marking device comprising post means mounted adjacent to one side of the conveyor, an arm having an end portion rotatably mounted on the post means above the level of the conveyor, said arm carrying a printing roller having printing means and rotatably mounted below its outer end and an inking roller rotatably mounted inwardly of the printing roller and in engagement with the printing means on the printing roller during rotation of the printing roller, ink supply means mounted on the arm and in engagement with the inking roller, a cross head fixed to the upper end of said post means above said arm, said cross head having a portion spaced from the axis of said post means, pin means mounted in said spaced portion, a spring assembly, said spring assembly comprising a first cross block extending transversely of said arm and having its central portion pivotally carried by said support arm, rod means extending from each side of said first cross block and substantially parallel with said support arm, a second cross block extending transversely of said arm and having its central portion rotatably engaged with said pin means and having spaced openings which receive said rod means, said rod means extending beyond said second cross head, the ends of said rod means having adjustably mounted retaining means for shifting the position of the second cross block along said rod means, and compression spring means mounted on each of said rod means and tending to urge said first and second cross blocks apart, whereby engagement of a container with said printing roller causes said arm to pivot out of the path of said container whereby said second cross block is moved closer to said first cross block thereby compressing said springs and whereby when said container has passed, said springs cause said support arm to return to the initial position.

4,566,383

WINDING APPARATUS FOR REMOVING USED STENCIL

Ken Matsushita, and Tetsuo Onishi, both of Wakayama, Japan, assignors to Duplo Seiko Corporation, Wakayama and Duplo Manufacturing Corporation, Tokyo, both of, Japan

Filed Aug. 20, 1984, Ser. No. 642,164
Int. Cl.[4] B41L *13/08*
U.S. Cl. 101—121 **7 Claims**



1. A winding apparatus for removing a used stencil in a printing machine having means for lifting a leading end of the used stencil from a printing drum assembly in the printing machine and means including a pair of transporting rollers for transporting the used stencil into said winding apparatus, which apparatus comprises:

a generally cylindrical floating core for taking up the used stencil therearound;

support means for rotatably supporting the core in contact therewith, said support means contacting said core through the used stencil when the core is at least partially wound with said used stencil; and

said support means including drive means comprising at least first to fourth rollers disposed around the core for rotating the core about a longitudinal axis thereof at a speed substantially synchronized with the speed of transport of the used stencil, said first to fourth rollers cooperating with at least first to third endless spring members in the form of coiled wire members, said first to third endless spring members being entrained between said first and second rollers, said second and third rollers, and said third and fourth rollers, respectively.

4,566,384

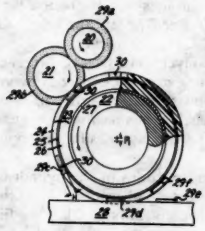
INTAGLIO PRINTING PLATE AND PRINTING METHOD

Katsutoshi Matsumoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto and Toray Industries, Inc., Tokyo, both of, Japan

Continuation of Ser. No. 458,981, Jan. 18, 1983, abandoned, which is a continuation of Ser. No. 213,114, Dec. 4, 1980, abandoned. This application Oct. 12, 1984, Ser. No. 660,251
Int. Cl.[4] B41C *1/00;* B41N *1/00;* B41M *1/10;* B41F *9/00*
U.S. Cl. 101—170 **8 Claims**

1. An intaglio printing plate for clear, substantially flawless, direct printing on to an object comprising: an ink-repellent outer layer which comprises an ink-repellent material selected from the group consisting of a silicone rubber and a rubber material containing a fluorine compound, a photosensitive layer laminated beneath the outer layer and an elastic layer laminated beneath said photosensitive layer, the plate having ink-accepting recesses corresponding to the image lines, which

are formed by removing imagewise at least the ink-repellent outer layer, and the elastic layer having a thickness of 100 to 1000 microns and a hardness of 30 degrees to 90 degrees on the Shore scale A, wherein the elastic layer is compressible in



response to printing pressure applied through the ink accepted in the recesses and the ink-repellent outer layer to thereby substantially prevent the ink accepted in the recesses from being forced out of the sides of the recesses.

4,566,385

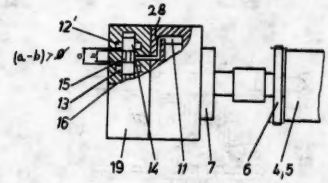
HYDRAULIC DRIVE FOR MULTI-COLOR SHEET-FED ROTARY PRINTING MACHINES

Hans-Jürgen Tappert; Johannes Naumann, both of Coswig; Karl-Heinz Förster, Dresden; Herbert Doliner, Niederau; Fritz Pieper; Werner Frenzel, both of Radebeul, and Klaus Schanze, Coswig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 384,767, Jun. 3, 1982, abandoned, which is a continuation-in-part of Ser. No. 353,588, Mar. 1, 1982, abandoned. This application May 25, 1984, Ser. No. 614,727

Int. Cl.[4] B41F *5/02, 13/00*

U.S. Cl. 101—183 **3 Claims**



1. In a multi-color, sheet-fed rotary printing machine including a plurality of consecutively arranged press units each having a plurality of sheet-processing cylinders, and gear trains for interconnecting said cylinders, a hydraulic driving device comprising a plurality of constant-flow radial piston type hydraulic motors each having an intake port and a discharge port for admitting and discharging pressure fluid and means for distributing the pressure fluid to respective radial pistons, a power output member directly connected to one of said cylinders in the assigned press unit for driving the same; an adjustable pump for supplying pressure fluid into said hydraulic motors; an electric motor for driving said pump; a first hydraulic control means including a main control valve and a switching control valve connected between said pump and said hydraulic motors; and second hydraulic control means provided in each of said hydraulic motors, said second hydraulic control means including a cylindrical bore, said ports communicating with said bore and forming with its inner wall control edges spaced apart in axial direction, a conduit opening into said bore between said control edges and leading to said distributing means, a reciprocating piston movable in said bore past said ports, said piston being formed on its jacket with an annular control groove which during the movement of said piston alternately connects one of said ports with said conduit, the axial clearance of said groove being shorter than axial spacing between said control edges so that during the reversal of working phase into discharging phase of respective radial pistons, said reciprocating piston positively overlaps for a short period of time the control edges of both ports.

4,566,386

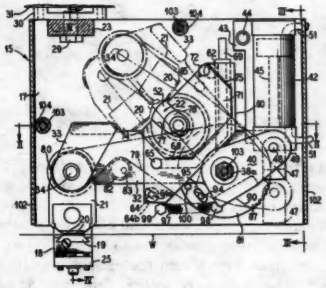
HOT INK IMPRINTER WITH SWINGING PRINT HEAD

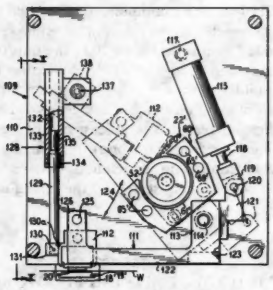
Charles F. Davison, Brookfield, Ill., assignor to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Filed Nov. 30, 1983, Ser. No. 556,279

Int. Cl.[4] B41F *1/08, 1/46*

U.S. Cl. 101—305 **15 Claims**





1. A hot ink imprinter, comprising:

anvil means for supporting a workpiece to be imprinted;

a rotatably mounted free-wheeling hot ink applicator roll;

an elongate operating rocker arm having two end portions and mounted on a pivot intermediate said end portions of the arm;

actuator means attached to one end portion of said arm for rocking said arm cyclically about said pivot intermediate said end portions;

a print head carrying imprinting means and mounted swingably on the opposite end portion of said arm;

a pulley mechanism including a timing belt connecting said arm and said actuator means for causing said print head to swing back and forth cyclically toward and past said arm as said arm is rocked for, in a first phase of the cycle causing said imprinting means to roll on said hot ink applicator roll in a first direction for applying ink to said imprinting means, in a second phase of the cycle causing said imprinting means to roll on said hot ink applicator roll in a second opposite direction with said hot ink applicator

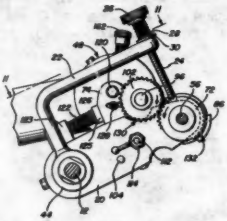
roll thereafter freely rotating for randomly orienting a portion thereof for a next roll of said imprinting means thereon, and in a third phase of the cycle effecting imprinting of the workpiece on said anvil means.

4,566,387

ARTICLE IMPRINTER AND CARTRIDGE INKER

Alfred A. Marozzi, 3 Cheryl Pl., Pine Brook, N.J. 07058

Filed Mar. 22, 1984, Ser. No. 592,374
Int. Cl.[4] B41K *1/42*; B41F *31/24*
U.S. Cl. 101—330 9 Claims



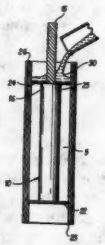
1. In an article imprinter including a pivotal mounting arm; a printing wheel rotatably mounted on said arm; an inking device carried by the mounting arm having an ink storing cartridge, a transfer roller mounted in operative relation to the cartridge and the printing wheel and wiper means for removing excess ink transferred from the cartridge to the transfer roller; transmitting means connected to the printing wheel for powered rotation thereof in one direction, intermittently engaged gear means including a first gear wheel connected to the transfer roller having a continuous toothed rim, and a second gear wheel connected to the printing wheel having at least one toothed rim segment of less than 360°, the improvement comprising means supporting the inking device on the mounting arm in adjustably positioned relation to the printing wheel for maintaining optimum meshing of the gear wheels of the intermittently engaged gear means, at least two of the gear teeth of the rim segment, leading in the one direction of rotation, being progressively reduced in addendum, whereby operational wear and depletion of ink stored by the inking device is minimized.

4,566,388

METHOD OF MAKING FIREWORKS

Lew W. Loyd, Jr., So. Pittsburg, Tenn., assignor to Space Age Manufacturing Co., Inc., Richard City, Tenn.

Filed Aug. 9, 1984, Ser. No. 638,931
Int. Cl.[4] F42B *4/04*
U.S. Cl. 102—361 1 Claim



1. A method of converting conventional Class C fireworks having an explosive body portion and a safety fuse which extends therefrom into safer and louder firecrackers comprising the steps of:

(A) forming a housing having a cylindrical side wall and first and second end portions of a size to completely receive the body portion of a conventional Class C firecracker therein so that an air space is created between the side walls of the cylindrical housing and the body portion of a conventional Class C firecracker,

(B) inserting the conventional Class C firecracker within the cylindrical housing so as to be spaced inwardly of said side walls thereof and spaced inwardly of said end portions thereof and in such a manner that the safety fuse extends outwardly of said housing adjacent one end portion thereof,

(C) closing the end portions of the cylindrical housing by inserting first and second material disks therein so as to firmly abut the conventional Class C firecracker and simultaneously engage the cylindrical side walls of said housing,

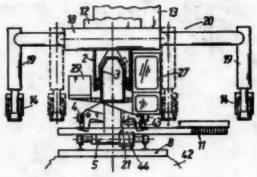
(D) sealing the material disks to the cylindrical side walls of the housing by filling the end portions of said housing with a glue.

4,566,389

MOBILE APPARATUS AND METHOD FOR RECEIVING AND TRANSPORTING AN ASSEMBLED TRACK SECTION

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 5, 1984, Ser. No. 678,763
Claims priority, application Austria, Apr. 10, 1984, 1208/84
Int. Cl.[4] E01B *29/02*
U.S. Cl. 104—3 16 Claims



1. A mobile apparatus for replacing an assembled section of track in a track renewal section, the assembled track section consisting of rails fastened to ties defining spaces therebetween, which comprises

(a) a succession of transport vehicles having undercarriages capable of running on the track for moving therealong,

(b) vertically adjustable means for gripping and carrying the assembled track section on said transport vehicles,

(c) an elongated overhead girder extending in a plane above the transport vehicles and having longitudinally extending sides defining therebetween a guide track for moving the succession of transport vehicles therealong,

(d) drive means for moving the vehicles along the guide track, and

(e) a succession of vertically and laterally adjustable supports for the overhead girder, the supports being laterally adjustable to selected lateral positions spaced from the girder sides whereby a wide enough space extending transversely to the track is left to permit the free passage

of an assembled track switch section carried by the transport vehicles moving along the girder, the supports including

(1) power drives for adjusting the supports.

4,566,390

CODE-RESETTING DEVICE FOR A CAR-TYPE TRANSPORTER

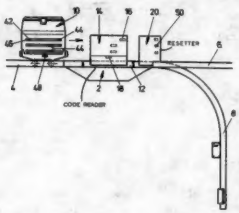
Karl W. Pforte, Munich, Fed. Rep. of Germany, assignor to Buro Patent AG, Spielhof, Switzerland

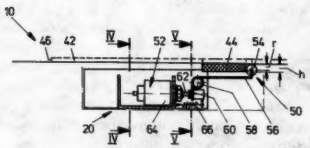
Filed Jun. 5, 1984, Ser. No. 617,349

Claims priority, application Switzerland, Jun. 6, 1983, 3094/83

Int. Cl.[4] B65G *47/48, 47/50*

U.S. Cl. 104—88 15 Claims





1. In a conveyor installation wherein cars circulate along a track and each car is provided along a side thereof with at least one code-setting marker displaceable along a guide from a starting position at an end of said guide in the direction of travel of the car and stations are provided along the track with code readers responsive to the position of said code-setting marker and with means for transferring a car carrying the appropriate code representing a particular station to a siding from said track the improvement which comprises resetting means along said track including:

a retaining abutment displaceable in a direction transverse to the direction of movement of said marker along said guide into a position wherein said retaining abutment can intercept said marker and into a position wherein said retaining abutment is retracted from interception of said marker;

actuating means connected with said retaining abutment for shifting same from one of said positions into the other of said positions; and

yieldable means acting upon said retaining abutment and effective with a force exceeding the resistance displacement of movement of said marker along said guide but less than the force with which said car travels along said track for yielding upon engagement by said retaining abutment with said marker and the shifting of said marker along said guide into said starting position by the movement of said car relative to said retaining abutment, whereby said marker thereafter clears said retaining abutment.

4,566,391

SUPPORT WHEEL FOR A CAMERA DOLLY

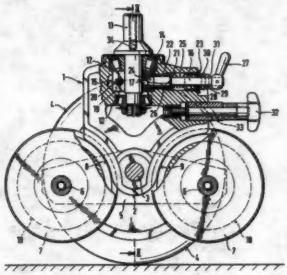
Karl Haberl, and Klaus Resch, both of Munich, Fed. Rep. of Germany, assignors to Schmidle & Fitz, Film-Gerate-Verleih, Munich, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,756

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303822

Int. Cl.[4] B61F *1/00*

U.S. Cl. 105—215 R 17 Claims



1. A suspension support for a camera dolly comprising:

a support member;

a ground wheel axle mounted in said support member;

at least one ground wheel rotatably mounted on said ground wheel axle to movably support said dolly on the ground;

at least one rail wheel axle mounted on said support member;

at least one rail wheel rotatably mounted on said at least one rail wheel axle to movably support and guide said dolly on a rail;

a steering shaft rotatably mounted on said support member with its axis of rotation extending substantially perpendicular to said ground wheel axle; and

a releasable coupling means to fixedly couple said steering shaft to said support member when said support member is movable on said at least one ground wheel and to release said steering shaft for free rotation when said support member is movable and guided on said at least one rail wheel comprising, a locking ring rotatably mounted on said steering shaft, and clamping means operatively associated with said ring to releasably clamp said ring non-rotatably onto said shaft, said locking ring being provided with an opening having a central axis extending substantially radially with respect to said shaft, and a locking pin slidably guided in said support member for reciprocating movement in a direction substantially radially with respect to said shaft and having an inner end aligned with said locking opening, so that said inner end is engageable in said locking opening to lock said steering shaft in a non-rotatable locked position with respect to said support member and is retractable out of engagement with said locking opening in an unlocked position for free rotation of said shaft.

4,566,392

SLAG TAP COMBUSTION APPARATUS

Takao Ishihara, Tokyo, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1985, Ser. No. 732,238

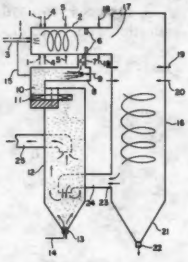
Claims priority, application Japan, Jun. 14, 1984, 59-120657

Int. Cl.[4] F23J *1/00*

U.S. Cl. 110—165 R 3 Claims

1. A slag tap combustion apparatus which is characterized by comprising a slag tap combustion furnace, a slag granulation chamber for granulating a slag discharged from said slag tap combustion furnace, a slag grain accumulation tower

which is filled with slag grains discharged from said slag granulation chamber, a secondary reactor provided with an inlet and an outlet for a waste gas from said slag tap combustion furnace and provided with means for introducing finely powdered lime, a duct for connecting said waste gas outlet of said secondary reactor to said slag grain accumulation tower, and another duct for allowing the waste gas to discharge from said slag accumulation tower.



4,566,393

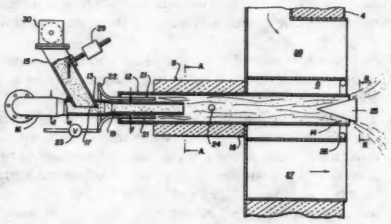
WOOD-WASTE BURNER SYSTEM

Ralph M. Connell, 2401 Bayou Blvd., Pensacola, Fla. 32503, and Edward O. Dawson, R.R. 4, Box 187, Brewton, Ala. 36426

Filed Feb. 15, 1984, Ser. No. 580,329

Int. Cl.[4] F23C *1/10*; F22B *5/00*

U.S. Cl. 110—261 **7 Claims**



1. A waste burner for burning a fuel comprising combustible, solid, divided wood-waste, said burner comprising

(A) an elongated cylinder having a longitudinal axis, a fuel inlet proximate one end thereof and an outlet at the other end thereof;

(B) means for supplying air to said burner for combusting said fuel, wherein said air supply means is positioned upstream of said fuel inlet such that the air initially mixes with said fuel in a turbulent mixing zone to form a fuel/air mixture;

(C) means for igniting said fuel/air mixture in said cylinder comprising a multiplicity of pilot flame nozzles substantially uniformly spaced around the circumference of said cylinder;

(D) diffuser means in said outlet for directing unburned fuel and combustion products away from said axis as said fuel and products exit said cylinder;

(E) means for detecting flame in said burning fuel/air mixture;

(F) conduit means for feeding fuel to said inlet;

wherein said diffuser means is of conical shape and said diffuser is positioned such that the longitudinal axis of said cone coincides with the longitudinal axis of said cylinder and the apex of said cone is inside said cylinder; and

wherein said cylinder has a length:diameter ratio between about 18:1 to 12:1 sufficient to partially combust said fuel therein, and wherein the length of the cylinder is equal to the distance between the pilot flame nozzles and the outlet of the cylinder.

4,566,394

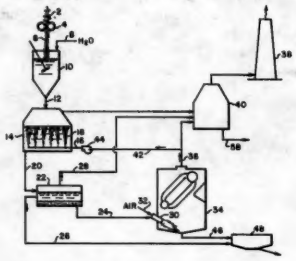
INTEGRATED COAL CLEANING PROCESS

Donald C. Borio, New Britain; Richard W. Borio, Somers; Gilbert L. Hale, Granby, all of Conn.; Arun K. Mehta, Los Altos, Calif., and Arnold L. Tyler, Torrington, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 625,271, Jun. 27, 1984. This application Jun. 3, 1985, Ser. No. 740,683

Int. Cl.[4] F23G *5/04*

U.S. Cl. 110—347 **5 Claims**



1. A process for beneficiating a sulfur-bearing coal by removing at least a portion of any alkali metals present therein, comprising the steps of:

comminuting said coal;

forming an acidic liquid-solid slurry of the comminuted coal and water by comingling an SO_2-bearing gas with the water to induce the formation of a sulfur-based acid therein;

maintaining the pH of said acidic liquid-solid slurry to a value equal to or less than 5 for a period of time sufficient to dissociate any alkaline metals present within the coal by forming dissolved sulfur compounds in the liquid portion of said slurry by reaction with the sulfur-based acid;

separating the liquid portion of said acidic slurry containing the dissolved alkali metal compounds from the solid portion of said slurry containing the now beneficiated coal; and

combusting the beneficiated coal in air to oxidize any sulfur compounds present therein, forming an SO_2-bearing gas of which a portion is used to form said acidic liquid-solid slurry.

4,566,395

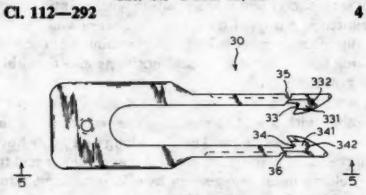
SEWING MACHINE NEEDLE THREAD CAPTURING AND SEVERING MECHANISM

John Tummino, Maywood, N.J., assignor to Clinton Industries, Inc., Carlstadt, N.J.

Filed Nov. 5, 1984, Ser. No. 667,990

Int. Cl.[4] D05B *65/02*

U.S. Cl. 112—292 **4 Claims**



1. In a sewing machine having two bobbins, two sewing

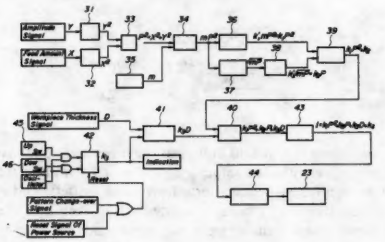
needles, and means for capturing and severing bobbin threads comprising a stationary blade, a picker having means forming two hooks for capturing bobbin threads and means for moving the picker towards the blade to sever the bobbin threads, the improvement wherein the means forming the two hooks comprising a fork-shaped portion with two outer straight edges; and further comprising means disposed on the picker for capturing two needle threads and cooperative with the blade for severing the needle threads upon movement of the picker towards the blade, comprising a notch in each straight edge.

4,566,396

THREAD FEED MECHANISM IN SEWING MACHINE

Kuniharu Sakuma, and Sumio Goto, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd, Chofu, Japan

Filed Sep. 27, 1984, Ser. No. 655,345
Int. Cl.[4] D05B *45/00*
U.S. Cl. 112—302 **2 Claims**



1. In a thread feed mechanism in a sewing machine in which thread in a length corresponding to a set signal is payed out of a supply source by a paying-out device which operates based on said set signal each time a seam is to be formed and fed to a thread take-up lever, characterized by:

a first signal generation device for producing a feed amount signal X corresponding to a workpiece pitch for one seam and an amplitude signal Y corresponding to the amplitude of a needle bar in response to the operation of said sewing machine before said lever completes the straining of said thread in said seam;

a second signal generation device for detecting the thickness of a workpiece at the sewing area of said sewing machine and producing a workpiece thickness signal D corresponding to said thickness before said thread take-up lever completes the straining of the thread in said seam;

first means **31**, **32** and **33** for adding square values of said feed amount and amplitude signals together and outputting the resulting value;

second means for multiplying a square root of the output of said first means by a coefficient k'_2 and outputting the resulting value;

third means for producing a signal k_3 which varies depending upon the operation mode of said third means;

fourth means for multiplying said workpiece thickness signal by the output of said third means and outputting the resulting value; and

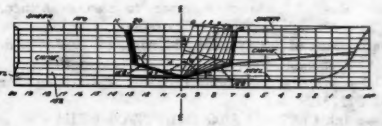
fifth means for adding the outputs of said second, third and fourth means together and outputting the resulting value, whereby the output of said fifth means is made a set signal or the reference data for said set signal.

4,566,397

CREW BOAT

Glenn L. Cavanaugh, and William C. Raffield, both of Panama City, Fla., assignors to Trio Corporation and Cavanaugh Marine Corp., both of South Port, Fla.

Continuation of Ser. No. 318,561, Nov. 5, 1981, abandoned. This application May 6, 1985, Ser. No. 731,337
Int. Cl.[4] B63B *1/16, 3/00*
U.S. Cl. 114—56 **16 Claims**



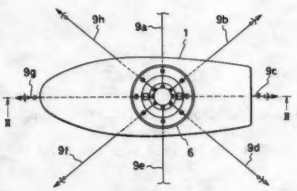
1. A crew boat capable of servicing offshore installations comprising the combination of a hull having a rear portion defined by a chine line that remains substantially horizontal from midships rearwardly to the transom and a slight V-shaped bottom with the bottom surfaces defined thereby remaining substantially flat throughout and being angled at a substantially constant angle relative to the vertical center line of said boat, said hull further including side walls extending upwardly from the perimeter of the bottom surfaces with the angle therebetween from midships rearwardly in said rear portion being substantially constant, and a progressively increasing V-shaped hull extending from midships forward, means defining interior tankage space integrally formed with the hull and internal framing thereof for transporting liquid supplies, crew quarters for housing the boat crew and at least a full crew for the offshore installation, fore and aft deck means respectively for defining a multi-story deck house in the fore part of the crew boat and a cargo area aft of the deck house, said interior tankage means including a first portion formed integrally with the hull and extending from midships forward a predetermined distance beneath said deck house means for carrying off-loadable liquid supplies for the off-shore installation and a second portion formed integrally with the hull beneath said cargo area for carrying on board liquid supplies, fire fighting means for fighting a variety of types of fires, a pumping system for suitably pumping liquid supplied on board and off board of said boat and engine means for controlling operation of said boat.

4,566,398

ANCHORING APPARATUS

Masahiko Sasaki; Kenji Watanabe, and Seiichi Kitamura, all of Tamano, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,197
Claims priority, application Japan, Feb. 9, 1984, 59-22283
Int. Cl.[4] B63B *21/24*
U.S. Cl. 114—293 **6 Claims**



1. An anchoring apparatus for a floating offshore structure comprising: a mooring plug rotatably fitted relative to said floating offshore structure, a plurality of pairs of diametrically opposed anchor cables radially stretched from said mooring plug to the seabed, and a pair of mobile windlasses mounted on

said mooring plug and movable to respective positions under any pair of said diametrically opposed cables, each of said windlasses carrying a warping drum and a pressing drum for engaging and clamping onto the corresponding cable when said windlass is so positioned with respect thereto to haul said clamped cable.

4,566,399

SLIDER CONTROL

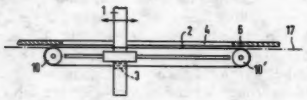
Reinhard Hildebrand, and Bernd Waldmann, both of Redwitz, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 478,344, Mar. 24, 1983, abandoned. This application Dec. 5, 1984, Ser. No. 678,373

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211319

Int. Cl.[4] B60Q *9/00*; B61D *27/00*; H01H *9/04*

U.S. Cl. 116—28 R **3 Claims**



2. In a slider control of a heating and ventilating system of an automotive vehicle having a passenger compartment and a control panel facing thereinto, said slider control comprising illumination means including a light source on a side of said control panel opposite said passenger compartment for providing a visual display indicating the operating state of said heating and ventilating system, said slider control further comprising actuating means including an operating lever traversing a slot in said control panel for modifying the operating state of said heating and ventilating system, the improvement comprising an endless web attached to the operating lever and a pair of rolls about which said web is partially wound, said rolls being disposed at opposite ends of the slot in the control panel, said web having a length at least twice the length of a complete stroke of said lever along a linear path defined by the slot in the control panel, said web having at all times a web portion disposed in a plane parallel to and proximate to said slot, said portion having a width at least equal to the width of said slot and being movable with said lever in a longitudinal direction parallel to said slot, whereby passage of light and dust particles through said slot is prevented by said web and said lever, said web having a pair of edges extending at least partially in a longitudinal direction parallel to said slot, said web being attached to said lever proximately toone of said edges, said web being provided with an aperture disposed proximately to the other of said edges and transversely across said web from said lever, said lever including an enlarged portion on a side of said slot opposite the passenger compartment, said enlarged portion being wider than said slot and said web and provided with an opening traversed by a portion of said web spaced from said slot.

4,566,400

HANDBELL

Charles E. Keenan, Perkasie; Richard E. Mattern, Souderton, and Charles A. Vaccaro, Ambler, all of Pa., assignors to Schulmerich Carillons, Inc., Sellersville, Pa.

Filed Jul. 29, 1983, Ser. No. 518,627

Int. Cl.[4] G10K *1/071, 1/10, 1/36*

U.S. Cl. 116—171 **8 Claims**

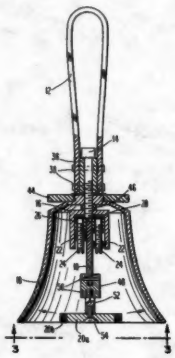
2. A handbell comprising

(1) a bell body member

(2) a clapper suspension comprising an elongated resilient shaft member which flexes more easily in a first plane than in the plane perpendicular thereto; and

(3) a clapper having a substantially circular periphery and comprising an inner member of a hard material and an outer member of a resilient material for contacting said bell body member, the radial extent of said resilient material between said inner member and the periphery of said clapper varying substantially continuously around said clapper;

wherein said clapper suspension defines a fixed perferred plane of swing of said clapper substantially identical to said first plane of easy flex; wherein said clapper is rotatably adjustable such that different points on the periphery of said clapper may be selected to contact said bell body member, whereby the hardness of the contact between



said clapper and said bell body member and tonal quality produced by said contact may be varied with respect to a given physical force exerted on the handbell, said rotatable adjustability being provided by affixing said clapper to said shaft member by a polygonal core member fitting into a corresponding-shaped orifice in a resilient bushing member carried in a bushing retainer so that upon application of a torque to said clapper, the bushing member is compressed permitting relative movement of the bushing member with respect to the shaft member, whereby variation between a number of predetermined relative positions of said clapper and the plane of swing of said shaft member is provided.

4,566,401

DYNAMIC CURRENT INTERRUPTION-TYPE INDICATORS AND METHOD THEREFOR

Masao Tomita, Nagoya, Japan, assignor to Kinki Denki Co., Ltd., Nagoya, Japan

Filed Aug. 26, 1983, Ser. No. 526,633

Claims priority, application Japan, Apr. 4, 1983, 58-59085; Apr. 4, 1983, 58-59087

Int. Cl.[4] G01D *3/04*

U.S. Cl. 116—207 **7 Claims**

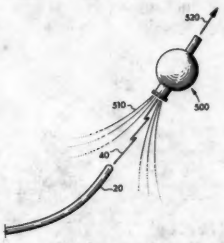
1. An improved dynamic current interruption-type indicator responsive to lightning strikes having a base (110), with one end of said base being closed and having a formed orifice (150) therein, a globe (100) disposed over said base, and a separation plate (120) wherein said separation plate closes off a hollow cylindrically-shaped passageway (140) located on the interior of said base, said improvement comprising:

a cylindrical tube (300) having an outside diameter slightly less than the inside diameter of said passageway (140) and said tube extending the longitudinal length of said passageway,

a propellant (320) having water of hydration as a part of its chemical make-up disposed in the interior of said tube (300), said propellant (320) having a hole formed at the

center of said tube (300) and said formed hold (330) extending the entire length of said tube, and

a conductive wire (340) contained in said formed hole, said conductive wire (340) extending the longitudinal length of



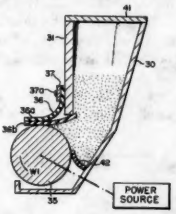
said tube (300), said wire being receptive of the arc from said lightning strike for melting and for uniformly causing the water of hydration of said propellant (320) to vaporize along the entire length of said formed hole.

4,566,402

DEVELOPING APPARATUS

Takashi Shimazaki, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1984, Ser. No. 665,344
Claims priority, application Japan, Oct. 28, 1983, 58-200763
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—653 **8 Claims**



1. A developing apparatus for use in developing a latent image within a photocopying machine comprising:

developing agent carrier means for carrying a developing agent thereon;

housing means for housing said developing agent therein and supplying said developing agent to said developing agent carrier means; and

elastic member means for pressing against the surface of said developing agent carrier means to apply the developing agent thereto, so that said developing agent is applied to said surface of said developing agent carrier means by said elastic member means and for forming a layer of said developing agent on said surface of said developing agent carrier means;

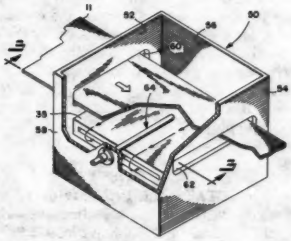
wherein said elastic member means comprises a fixed plate and a contact plate which are both constructed of elastic material, and are fixed to each other at one end thereof, the other end of said fixed plate being fixed to said housing means, and a central portion of said contact plate being pressed against the surface of said developing agent carrier means.

4,566,403

APPARATUS FOR MICROWAVE GLOW DISCHARGE DEPOSITION

Eugene Fournier, Garden City, Mich., assignor to Sovonics Solar Systems, Solon, Ohio

Filed Jan. 30, 1985, Ser. No. 696,389
Int. Cl.[4] C23C *11/00*
U.S. Cl. 118—718 **21 Claims**



1. Apparatus for depositing a material onto a substrate from a microwave energy excited plasma, said apparatus comprising:

a deposition chamber;

microwave energy source means for producing radio frequency energy at a microwave wavelength;

a microwave antenna disposed within said chamber;

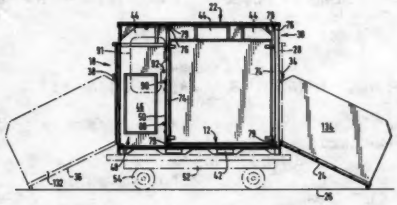
coupling means for coupling energy from said microwave energy source means to said antenna, wherein said antenna includes a conducting sheath approximately one half said wavelength long and an inner conductor coaxially disposed within said sheath, and means for electrically connecting said sheath and inner conductor at their respective distal ends.

4,566,404

ANIMAL CONVEYANCE CAPABLE OF CONVERSION INTO AN AIR FREIGHT CONTAINER

Giles A. Instone, and Jeremy A. Instone, both of London, England, assignors to Solindo Equipment Leasing Ltd., London, England

Filed Apr. 16, 1984, Ser. No. 600,624
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—8 **20 Claims**



1. A reusable conveyance for the transportation by air of at least two horses or like-sized quadrupeds, the conveyance being formed of strong and lightweight materials for compliance with regulations governing the carriage by air of both livestock and freight and comprising an internal chamber defined by four walls, a base and a roof, a first wall portion of said chamber formed to be selectively utilizable as a ramp for loading horses into said chamber, a second wall portion of said chamber at a different part of said chamber formed to be selectively utilizable as a ramp for off-loading horses from said chamber, and partitioning demountably secured within said

chamber for defining at least two compartments wherein horses may be housed separately from one another and a further compartment for an attendant servicing horses in said at least two compartments, said partitioning enabling an attendant in said further compartment to access each of said at least two compartments from said further compartment, selectably releasable cooperating fixing means provided on said partitioning and in said chamber providing for the demountable securement of said partitioning at locations appropriate for use of the conveyance for the carriage of animals and enabling said partitioning to be demounted to free substantially the entire chamber of internal divisions for readily adapting the conveyance for the carriage of freight when not being used for the carriage of animals, and door means for providing access to said further compartment from outside of said conveyance when said ramps are not deployed.

4,566,405

ROTATABLE PLATFORMS

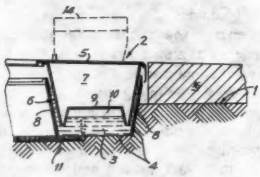
John A. Graham, 38 Hogan St., Hamilton, New Zealand

Filed Mar. 14, 1983, Ser. No. 475,097

Claims priority, application New Zealand, Mar. 12, 1982, 200001; Sep. 21, 1982, 201960; Nov. 18, 1982, 202541

Int. Cl.[4] A01K *1/12*

U.S. Cl. 119—14.04 **5 Claims**



1. A rotatable platform comprising a base and rotating member having a loading deck arranged to be supported from the base by a fluid, said rotating member being rotatable with respect to the base whilst being supported above the base by said fluid wherein the platform is supported by fluid pressure developed by mechanical means and the base is a raised disk-like member and the loading deck is arranged to be supported over the base, there being provided sealing means at the periphery of said disk-like member such that fluid chambers are defined between the upper surface of the disk-like member and the lower surface of said loading deck and sealing means and pumping means is arranged to supply fluid under pressure to said fluid chambers.

4,566,406

SLUDGE REMOVING APPARATUS FOR A STEAM GENERATOR

Robert H. Appleman, Pleasant Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1983, Ser. No. 513,209

Int. Cl.[4] F22B *37/48*

U.S. Cl. 122—405 **3 Claims**

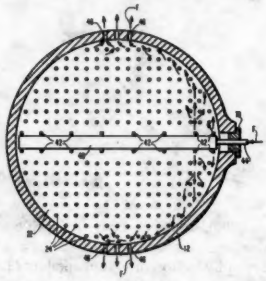
1. A nuclear steam generator comprising:

a generally cylindrical outer shell;

a generally flat tubesheet disposed in said outer shell;

a plurality of U-shaped tubes disposed within said outer shell and mounted in said tubesheet for conducting a nuclear reactor coolant therethrough and defining a tubeless lane on said tubesheet extending along a diameter of said tubesheet and defining a peripheral lane on said tubesheet and between said tubes and said outer shell; and

a manifold attached to said tubesheet and disposed in said tubeless lane with said manifold having a plurality of independent internal first conduits with each of said first conduits terminating near the outer surface of said manifold in alignment between rows of said tubes and with each of said first conduits having at last two terminal ports with a nozzle disposed in each of said ports and directed from said manifold in generally opposite directions for simultaneously discharging fluid therefrom in substantially opposite directions and for selectively and independently directing fluid streams against said tubesheet for dislodging sludge deposits therefrom, and with said manifold having an independent internal second conduit with said second conduit terminating near said outer surface of said manifold with a nozzle disposed therein and in alignment with said peripheral lane for selectively and independently directing a fluid stream against said tubesheet for entraining said dislodged sludge deposits for removal from said steam generator.



4,566,407

COOLING ARRANGEMENT FOR AN AUTOMOTIVE VEHICLE, ESPECIALLY A PASSENGER CAR

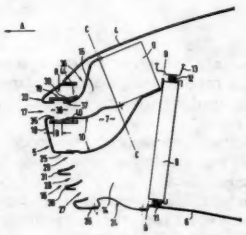
Dietmar Peter, Hemmingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,568

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338466

Int. Cl.[4] F01P *3/18*

U.S. Cl. 123—41.48 **28 Claims**



1. Automotive vehicle, especially a passenger car, having a bumper, at least two radiators and an air guidance system for guiding a cooling air stream the radiators, said air guidance system comprising:

a separate air duct for each radiator, each said air duct having an inlet port,

each said air duct extending from said inlet port to said radiator, and

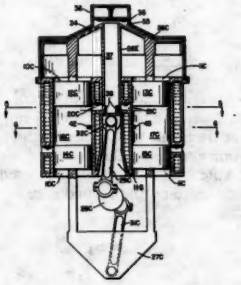
each said inlet port having means for directing a flow of cooling air.

4,566,408

INTERNAL COMBUSTION ENGINE

James M. Lapeyre, 13 Richmond Pl., New Orleans, La. 70151

Continuation of Ser. No. 97,955, Nov. 28, 1979, abandoned, which is a continuation of Ser. No. 890,980, Mar. 28, 1978, abandoned. This application Feb. 24, 1981, Ser. No. 237,667
Int. Cl.[4] F02B *25/08*
U.S. Cl. 123—51 B 4 Claims



1. A two cycle internal combustion diesel engine comprising in combination:

(a) a minimum of two side by side spaced apart axially parallel cylinders,

(b) a hollow guideway positioned between, parallel to and axially coplanar with said spaced apart cylinders,

(c) one variable volume combustion chamber contained within each of said cylinders,

(d) air intake porting located in each cylinder wall at a first end of said combustion chamber,

(e) air compressing means in communication with said porting for simultaneously forcing air into each of said combustion chambers via said air intake porting,

(f) exhaust porting located in each cylinder wall at a second end of said combustion chamber,

(g) means for delivering fuel into said cylinders approximately midway of the length of said combustion chamber, when said combustion chamber is at its approximate minimum volume, said means including a pre-combustion chamber common to and in communication with said combustion chamber of each of said cylinders, said pre-combustion chamber being positioned outside of the plane of the axes of said cylinders,

(h) one cylindrical single headed pressure sealing valveless air intake controlling piston coaxial with and slidably mounted within each of said cylinders, said piston having its head end facing the combustion chamber and its connector end facing a first non-combustion end of said cylinder, said piston being adapted to open and close said air intake porting as it slides past said air intake porting,

(i) a rigid non-pivotal piston bridging means spanning from piston axis to piston axis of said air intake controlling pistons,

(j) dual rigid and operationally non-pivotal piston connector means extending from said piston bridging means, said piston connector means being adapted to link said piston bridging means with said air intake controlling pistons at said pistons' connector ends,

(k) bridge guide means extending from said piston bridging means into said hollow guideway, said bridge guide means terminating in a connecting rod pivot means,

(l) one cylindrical single headed pressure sealing valveless exhaust controlling piston coaxial with and slidably mounted within each of said cylinders, said piston having its head end facing said combustion chamber and its connector end facing a second non-combustion end of said cylinder, said piston being adapted to open and close said exhaust porting as it slides past said exhaust porting,

(m) a second rigid non-pivotal piston bridging means spanning from piston axis to piston axis of said exhaust controlling pistons,

(n) second dual rigid and operationally non-pivotal connector means extending from said second piston bridging means, said second piston connector means being adapted to link said second piston bridging means with said exhaust controlling pistons at said pistons' connector ends,

(o) a single crankshaft located between said parallel axes of said cylinders and between the two piston bridging means, the axis of said crankshaft being at right angles to the plane of said cylinders' parallel axis,

(p) at least two connecting rods between the two piston bridging means, one of said connecting rods being connected to pivot means of said bridge guide means and to said crankshaft, and a second connecting rod connected to said second piston bridging means and to said crankshaft,

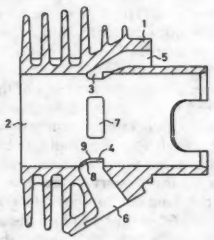
(q) said connections to said crankshaft being made to angularly spaced cranks carried by said single crankshaft, said angular spacing of said cranks being such that as the crankshaft rotates through 360°, the two piston bridging means and their respectively connected pistons are forced to move in opposite directions, the two air intake controlling pistons being reciprocated n unison and the two exhaust controlling pistons likewise being reciprocated in unison and wherein said air intake controlling pistons are forced to lag behind said exhaust controlling pistons in such a manner that said exhaust porting is forced to open prior to the opening of said air intake porting and said exhaust porting is forced to close prior to the closing of said air intake porting.

4,566,409

TWO-CYCLE ENGINE

Yoshinobu Yashiro, and Takeshi Ito, both of 2822 Nishikaizuka, Iwata-shi, Shizuoka-ken, Japan

Filed Dec. 3, 1982, Ser. No. 446,652
Claims priority, application Japan, Dec. 15, 1981, 56-201864
Int. Cl.[4] F02B *25/04*
U.S. Cl. 123—65 PE 12 Claims



1. In a two-cycle internal combustion engine which includes a cylinder having a central axis, an internal cylindrical cylinder wall and an exhaust port, said exhaust port having a cross section substantially contant along its length and an internal peripheral wall which intersects and opens into said cylinder wall, forming a junction therewith, the said junction having a pair of lateral edge segments extending generally axially, and an upper and lower edge segment joining said lateral edge segments to form said junction substantially as a quadrilateral, the improvements comprising: a groove formed in said exhaust port wall extending to said junction, extending along at least both lateral edge segments and said upper edge segment, said junction at said last mentioned three segments lying in the cylindrical surface of the cylinder wall, said groove having a first sloping boundary wall on its side closest to said cylinder which lies at a dihedral angle on greater than 90 degree with

said cylinder wall and forming an edge with said junction, the cross section of said exhaust port being equal to that at said junction edge.

4,566,410

DIESEL ENGINE GLOW PLUG CONTROLLING DEVICE

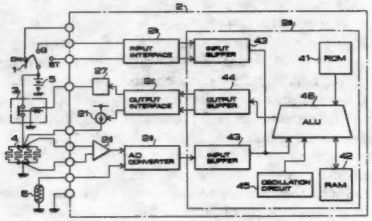
Akira Demizu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1984, Ser. No. 633,016

Claims priority, application Japan, Jul. 21, 1983, 58-133943

Int. Cl.⁴ F02P *19/02*

U.S. Cl. 123—179 BG **10 Claims**



1. A glow plug controlling device for a diesel engine having a plurality of cylinders comprising:

glow plugs of a fixed resistance temperature characteristic attached to the cylinders;

a glow relay connected in series to a power supply circuit for supplying a fixed current to the glow plugs;

detection current supply means to supply a detection current to the glow plugs in order to detect the temperature of the glow plugs while the glow relay is opened;

a water temperature sensor of a fixed resistance temperature characteristic for detecting the temperature of the cooling water of the engine;

a key switch for generating a glow plug controlling operation starting signal;

analog-to-digital conversion means for converting the analog values both of a temperature detect1on signal corresponding to a voltage drop caused by the glow plugs under the detection current and of a detection signal given by the water temperature sensor into digital values; and

a computer adapted to decide whether or not the engine needs to be preheated on the basis of the detection signal given by the water temperature sensor when the glow plug controlling operation starting signal is given by the key switch, to calculate a current supply time necessary to heat the glow plugs to a predetermined temperature when the preheating is necessary, to generate an OFF-signal to interrupt the function of the detection current supply means and an ON-signal to close the glow relay during said current supply time, and to generate periodically ON- and OFF-signals for starting and interrupting the operation of the detection current supply means after the passage of said current supply time until the temperature of the glow plugs drops to a temperature below a predetermined temperature.

4,566,411

SPLIT CYCLE ENGINE

Frederick A. Summerlin, "The Spinney", Rose La., Wheathampstead, St. Albans, Hertfordshire, England

Filed Mar. 14, 1983, Ser. No. 475,178

Claims priority, application United Kingdom, Apr. 2, 1982, 8209934

Int. Cl.⁴ F02B *53/08*

U.S. Cl. 123—213 **2 Claims**

1. A split cycle engine adapted to drive a load, which engine comprises, in combination:

first and second positive displacement compression units for compressing working fluid therein;

first and second positive displacement expansion units, adapted to be driven by the expansion of working fluid therein;

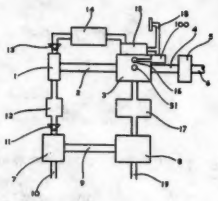
the first expansion unit having a variable cut-off ratio;

a transfer passage connected between the first compression unit and the first expansion unit for transferring working fluid which has been compressed by the first compression unit to the first expansion unit to drive the first expansion unit by expanding therein;

variable heat-supply means for supplying heat at a variable rate to the working fluid in one of the transfer passage and the first expansion unit;

a first driving connection connecting the first expansion unit to the first compression unit for driving the first compression unit from the first expansion unit, the first driving connection also being effective to drive the aforesaid load;

a first working fluid connection connected between the first expansion unit and the second expansion unit to deliver



working fluid which has been expanded in the first expansion unit to the second expansion unit to drive the second expansion unit by further expanding therein;

a working fluid exhaust connected to the second expansion unit for the outlet of working fluid which has been expanded therein;

a second driving connection drivingly decoupled from said first driving connection and from said load and, connecting the second expansion unit to the second compression unit for driving the second compression unit from the second expansion unit;

a working fluid inlet connected to the second compression unit for supplying work fluid thereto;

a second working fluid connection between the second compression unit and the first compression unit to deliver working fluid which has been compressed by the second compression unit to the first compression unit to be further compressed thereby; and

cut-off ratio varying means associated with the first expansion unit for varying the cut-off ratio of the first expansion unit.

4,566,412

INTAKE SYSTEM FOR ROTARY PISTON ENGINE

Tomoo Tadokoro; Hideo Shiraishi, and Haruo Okimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 28, 1983, Ser. No. 555,534

Claims priority, application Japan, Nov. 27, 1982, 57-208152

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ F02B *53/04*

U.S. Cl. 123—216 **15 Claims**

1. A two rotor type rotary piston engine comprising:

a casing comprised of

a pair of rotor housings, each rotor housing having an inner wall of trochoidal configuration,

an intermediate housing located between the rotor housings, and

a pair of side housing secured to outer sides of the respective rotor housings to define rotor cavities in the respective rotor housings,

a pair of substantially polygonal rotors disposed in the respective rotor cavities with apex portions in sliding engagement with the inner walls of the respective rotor housings to define working chambers of cyclically variable volumes,

eccentric shaft means carrying said rotors so that said rotors are rotated with 180° phase difference in terms of angle of rotation of said eccentric shaft means,

intake means including

two individual intake port means provided in at least one of said intermediate and side housings and opening to the respective rotor cavities and being cyclically closed by said rotors as the rotors rotate, each of said two individual intake port means including main port means and auxiliary port means, said auxiliary port means being closed later than said main port means,

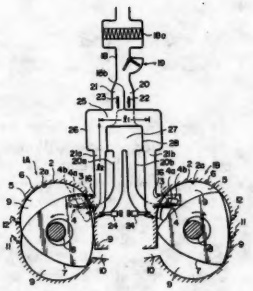
intake passage means including throttle valve means, said intake passage means including two individual passage means leading respectively to said two individual intake port means,

communicating passage means communicating with said two individual passage means and being located downstream of said throttle valve means,

control valve means for opening and closing said auxiliary port means,

said two individual intake port means having an opening period of 230° to 290° in terms of angle of rotation of said eccentric shaft means when the control valve means is closed and an opening period of 270° to 320° in terms of angle of rotation of said eccentric shaft means when the control valve means is opened,

said communication passage means and said two individual passage means leading to the respective rotor cavities having an overall length between 0.57 and 1.37 m for transmitting a compression wave produced in one of said two individual passage means in opening timing of one of said two individual intake port means to the other of said two individual intake port means just before said other of said two individual intake port means is closed to obtain an additional intake charge.



4,566,413

MIXTURE-COMPRESSION INTERNAL COMBUSTION ENGINE

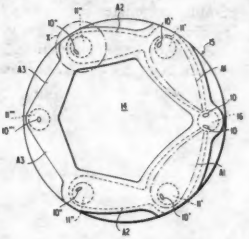
Rudolf Maly, Sindelfingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,689

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338216

Int. Cl.⁴ F02B *19/10*

U.S. Cl. 123—256 **8 Claims**



1. A mixture-compression internal combustion engine having a combustion space with auxiliary chambers, of which a first auxiliary chamber having an ignition unit is located in the cylinder head and a plurality of further auxiliary chambers located in the piston, and having injection ducts each of which connects a further auxiliary chamber to the combustion space, the injection ducts of the further auxiliary chambers open on a surface of the piston head and are aligned in a direction to produce a flame front propagated in a peripheral direction, and in which arrangement the injection duct of a first of said further auxiliary chambers points in the direction of an injection duct of a second auxiliary chamber, characterized in that the piston is provided with peripherally disposed proturberances each encompassing an auxiliary chamber extending into the combustion space, in which each of said ducts of further auxiliary chamber points in the direction of a piston trough located between each of the protuberances.

4,566,414

CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

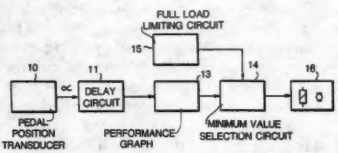
Albrecht Sieber, Böblingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 366,272, Apr. 7, 1982, abandoned. This application Oct. 18, 1984, Ser. No. 662,534

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114836

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—357 **14 Claims**



1. A control system for controlling fuel quantity in an internal combustion engine, comprising:

a driving-pedal position transducer for generating a pedal position signal indicating the position of an engine driving pedal;

a performance graph means, connected to receive said pedal

position signal, for generating a control signal in accordance with said pedal position signal;

an engine control device, connected to receive said control signal, for controlling an operation of said engine in accordance with said control signal;

at least one signal delay circuit means for delaying a signal supplied thereto;

said at least one signal delay circuit means being dependent on one output signal of at least one switching means and being controlled thereby in accordance with a selected engine operating parameter for either (1) connecting in series said signal delay circuit means in a series circuit between said driving-pedal position transducer and said performance graph means, or (2) disconnecting said delay circuit means from said series circuit.

4,566,415

SPEED CONTROLLER FOR MARINE PROPULSION DEVICE

Tomio Iwai, Hamamatsu, and Katsumi Torigai, Shizuoka, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 27, 1983, Ser. No. 565,239
Claims priority, application Japan, Dec. 28, 1982, 57-227558
Int. Cl.⁴ F02D *31/00*
U.S. Cl. 123—361 **16 Claims**

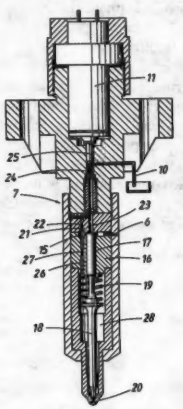
1. In a speed control mechanism for an internal combustion engine having an engine speed control for controlling the operational speed of the engine and movable through a range of positions, an operator controlled speed selector movable through a range of positions and means for interrelating said speed selector and said engine speed control for positioning said engine speed control in response to an operator input to said speed selector for setting the running speed of said engine, the improvement comprising said interrelating means including means for permitting said engine speed control to move independently of said speed selector, means for measuring the actual speed of said engine and means for moving said engine speed control independently of said speed selector for varying the actual running speed of the engine if the measured speed is not of a predetermined value, said means for moving said engine speed control being effective to move said engine speed control in a speed reducing direction if the measured engine speed is above a preset maximum desired engine speed and is effective to move the engine speed control in a speed increasing direction if the measured engine speed is below a preset minimum desired engine speed, said preset minimum and maximum desired engine speeds defining a range that includes the predetermined value.

4,566,416

ACCUMULATOR NOZZLE FUEL INJECTION SYSTEM

Max Berchtold, Zurich, Switzerland, assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 400,237, Jul. 21, 1982, abandoned. This application May 1, 1984, Ser. No. 605,856
Claims priority, application Austria, Jul. 31, 1981, 3371/81
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—458 **5 Claims**



1. In a method for the momentary injection of a discrete charge of fuel, of a selected volume within a range having a maximum volume and at a predetermined rate of injection, into a cylinder of a internal combustion engine with a fuel injector having a fuel injector body with a fuel injection valve opening and a valve seat surrounding the injection valve opening, an elongated valve member mounted within the valve body for engagement with the valve seat for closing the valve opening and to be momentarily shifted in opposite axial opening and closing directions thereof to be momentarily lifted from the valve seat for momentarily opening the valve member for said momentary injection of a discrete charge of fuel, the fuel injector body having a fuel inlet for receiving fuel at a continuous high inlet pressure, a first fuel pressure chamber connected to the fuel inlet to be pressurized to said high inlet pressure and in communication with the injection valve opening on the upstream side thereof for delivering fuel under pressure for fuel injection when the valve member is momentarily lifted from its valve seat, the valve member being hydraulically biased in its opening direction by said first fuel chamber pressure, closing bias means, including a second fuel pressure chamber connected to the fuel inlet to be pressured to said high inlet pressure to hydraulically bias the valve member in its closing direction at said high inlet pressure, said closing bias means with said closing hydraulic bias at said high inlet pressure being operable to hold the valve member in engagement with its valve seat against said opening hydraulic bias at said high inlet pressure, the fuel injection method comprising the steps of providing said first fuel chamber as an accumulator chamber with an accumulator volume substantially larger than said maximum volume, connecting said accumulator chamber to the fuel inlet by a first passage restriction to accumulate said substantially larger accumulator volume of fuel in said accumulator chamber at said high inlet pressure prior to said momentary fuel injection and so that the pressure of said accumulator volume of fuel in said accumulator chamber is isolated from the continuous high inlet pressure at the fuel inlet during the momentary opening of the valve member so as to decrease to substantially below said high inlet pressure during the momentary opening of the valve member for said momentary fuel injection and therefore so that the fuel injection rate is depen-

dent on the volume of the accumulator chamber and the accumulator chamber pressure prior to said momentary fuel injection, connecting said second pressure chamber to the fuel inlet by a second passage restriction to pressurize said second chamber to said high inlet pressure, and momentarily reducing said second chamber pressure to substantially below said high inlet pressure to rapidly open the valve member by said accumulator chamber pressure and then, after the pressure of said accumulator volume of fuel in said accumulator chamber decreases to substantially below said high inlet pressure, rapidly close the valve member by said second chamber pressure to produce said momentary injection of a discrete charge of fuel and selecting the volume of the injected charge and rate of fuel injection by controlling said continuous inlet pressure and the interval of momentary reduction of said second chamber pressure.

4,566,417

FUEL INJECTION CONTROL APPARATUS FOR DIESEL ENGINES

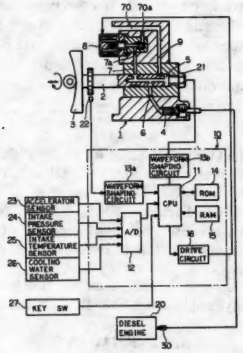
Yutaka Suzuki, Nishio; Nobuhito Hobo, Inuyama; Yoshihiko Tsuzuki, Toyota; Takashi Naito, Oubu; Mikio Kumano, Anjo; Tetsuya Nakamura; Satoshi Haseda, both of Kariya, and Akira Masuda, Chita, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 10, 1984, Ser. No. 598,593

Claims priority, application Japan, Apr. 18, 1983, 58-68030

Int. Cl.⁴ F02D *5/02*

U.S. Cl. 123—478 **5 Claims**



1. A fuel injection control apparatus for a diesel engine having a fuel injection pump with a fuel pressurizing chamber for injecting fuel into the engine through an injection nozzle connected with said fuel injection pump, comprising:

an overflow passage having a first end in communication with said fuel pressurizing chamber and a second end to communicate with a low pressure side of said pump;

a solenoid valve, disposed in said overflow passage between said first and second ends for controlling flow of fuel through said overflow passage;

an injection start detector for detecting, based on fuel pressure, an actual start time of fuel injection to the diesel engine and providing an injection start signal indicative thereof;

operating condition detector means for detecting at least one operating condition of said engine and providing an operating condition electric signal indicative thereof; and

a control circuit for controlling, responsive to said operating condition electric signal and said injection start signal, the opening and closing of said solenoid valve, said control circuit including:

means response to said operating condition electric signal, for calculating a target injection amount of fuel for injecting into said engine in a single injection;

means for calculating a target injection period of time corresponding to said target injection amount said target injection period extending from the time of said injection start signal to the opening of said overflow passage by said solenoid valve; and

means for driving said solenoid valve to open said overflow passage when said target injection period has elapsed from the time of said injection start signal.

4,566,418

ELECTRONICALLY CONTROLLED INTERNAL COMBUSTION ENGINE PROVIDED WITH AN ACCELERATOR POSITION SENSOR

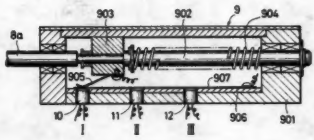
Minato Yamamoto, and Shunji Takahashi, both of Chigasaki, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,766

Claims priority, application Japan, Aug. 30, 1983, 58-158872; Aug. 30, 1983, 58-158874

Int. Cl.⁴ F02D *41/22*

U.S. Cl. 123—479 **3 Claims**



1. An electronically controlled internal combustion engine comprising an accelerator position sensor provided with an electrical contact wiper operatively connected to an accelerator pedal, an idling switch for indicating the position of said pedal at which a throttle valve is opened to the idling position, an intermediate switch for indicating the position of said pedal at which the throttle valve is opened to the middle position a fully opening switch for indicating the position of said pedal at which the throttle valve is opened to its fully open position, said respective switches being arranged along the moving track of said wiper within said accelerator position sensor and respectively issuing signals when said wiper crosses them, a first means connected to said accelerator position sensor and said respective switches, judging as a failure in case the output from said accelerator position sensor is not within a normal range previously memorized when a signal is generated by any of said respective switches and putting out a failure sensing signal, and a second means connected to said first means, judging a desirable running state on the basis of a combination of signals from said respective switches without accepting signals from said accelerator position sensor when said accelerator position sensor is judged to fail by said first means, and controlling an injector so that the desirable running state is obtained.

4,566,419

APPARATUS AND METHOD FOR CONTROLLING AIR-TO-FUEL RATIO FOR AN INTERNAL COMBUSTION ENGINE

Masakazu Ninomiya; Hideya Fujisawa; Norio Omori, all of Kariya, and Atsushi Suzuki, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 15, 1984, Ser. No. 640,987

Claims priority, application Japan, Aug. 20, 1983, 58-152064; Aug. 20, 1983, 58-152063

Int. Cl.⁴ F02B *3/00*; G01N *27/58*

U.S. Cl. 123—489 **6 Claims**

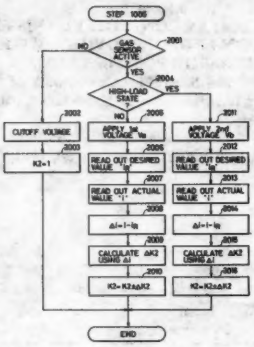
1. An air/fuel ratio control apparatus for an internal combustion engine, comprising:

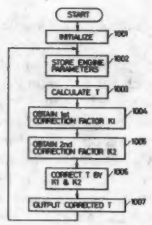
(a) means for detecting operating conditions of said engine;

(b) a gas sensor of constant-current type for detecting and outputting a signal indicative of a gas component includes in exhaust gases from said engine so that air/fuel ratio of an air-fuel mixture fed to said engine is detected at least when said air/fuel ratio is richer than a stoichiometric value or a value close thereto;

(c) voltage source means for applying a predetermined voltage to said gas sensor, said predetermined voltage being set to a value so that said gas sensor does not exhibit a constant-current characteristic;

(d) air/fuel ratio control means for controlling the air-fuel mixture fed to said engine; and





(e) computing means, responsive to said detected operating conditions and said signal from said gas sensor,

for determining whether said engine is required to receive an air-fuel mixture which is richer than said stoichiometric value or said value close thereto or not,

for causing said voltage source means to apply said predetermined voltage to said gas sensor only when said engine requires a rich mixture, and

for causing said air/fuel ratio control means to supply to said engine an air-fuel mixture of a desired air/fuel ratio, based on said detected operating conditions and said signal from said gas sensor, when said engine requires a rich mixture.

4,566,420

ELECTRONIC CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Masahide Sakamoto, Katsuta, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1985, Ser. No. 695,246

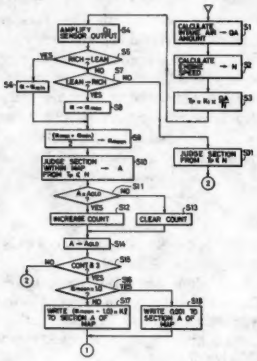
Claims priority, application Japan, Jan. 27, 1984, 59-11822

Int. Cl.⁴ F02M *7/00, 51/00*

U.S. Cl. 123—489 **2 Claims**

1. In a control apparatus for an internal combustion engine of the type in which a deviation value of a feedback control value from a reference value for each of predetermine engine operating condition sections of said engine is stored in a region in a memory in the form of a map and is read out in order to be used as a correction value when control is effected in relation to the corresponding predetermined engine operating condition section,

an electronic control apparatus for an internal combustion engine comprising an operating arrangement wherein the number of regions in said memory into which deviation



values for said operating condition sections have already been written are examined, and when said number of regions reaches a predetermined value, a deviation value is written into each of the said regions in said memory into which no deviation values have yet been written, said deviation value already being stored in the adjacent region in which writing of said deviation data has been completed.

4,566,421

APPARATUS FOR THE RPM-DEPENDENT ADJUSTMENT OF THE TIMING OF AN INJECTION PUMP

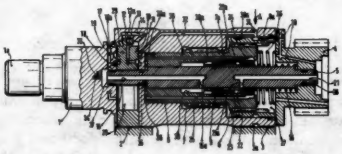
Otto Bauer, Munich; Lernhard Eberl, Lohhof; Gerhard Geyer, Munich, and Max Straubel, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 539,881

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238926

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—502 **13 Claims**



1. An apparatus for the rpm-dependent adjustment of the timing of an injection pump for internal combustion engines, embodied as a shaft-type injection adjuster, comprising a driven part connected with a rotationally driven driving part via an axially displaceable, sheath-like adjusting piston in a rotationally coupled manner with a relative rotary angle between the driven and the driving part being adjustable, said adjusting piston being axially displaceable thereby effecting a variation of the rotary angle between the driving and the driven part, said adjusting piston being supplied with a hydraulic pressure medium controlled at least indirectly by rpm via the influence of centrifugal force, an auxiliary piston which

directly under the influence of said centrifugal force forms a centrifugal force control piston and is connected in such a manner to a pressure medium supply means that a control flow of pressure medium effected by the displacement of said centrifugal force control piston generates a pressure medium required for an axial displacement of the adjusting piston, wherein the control pressure generated by the centrifugal force control piston acts upon a control piston, which by means of an effected displacement permits a supply of the pressure medium to a working face of the adjusting piston.

4,566,422

FUEL INTAKE SYSTEM FOR A SUPERCHARGED ENGINE

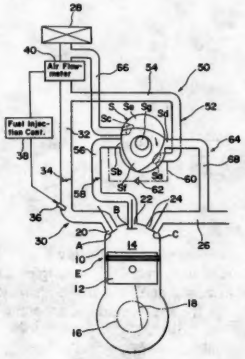
Tomoo Tadokoro; Haruo Okimoto, and Ikuo Matsuda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 418,746, Sep. 16, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,857

Claims priority, application Japan, Sep. 22, 1981, 56-149939; Sep. 28, 1981, 56-154439

Int. Cl.⁴ F02B *33/36*

U.S. Cl. 123—559 **6 Claims**



1. A fuel intake system for a supercharged internal combustion engine having at least one engine cylinder defined therein, which system comprises, in combination:

primary intake passage means for supplying at least a suction air to the combustion chamber; and

auxiliary intake passage means including a supercharger for supplying at least a supercharged air to the combustion chamber, said supercharger being constituted by a displacement air pump, said displacement air pump having a suction port, an exhaust port and a working chamber and being operable to exert a substantially pulsating flow of air from the exhaust port in correspondence with change in volume of the working chamber, means for driving said displacement air pump from the engine and for supplying the supercharged air into the combustion chamber at least during the period in which the combustion chamber is held under the compression stroke, said supercharger having first and second pairs of suction and exhaust ports, the suction and exhaust ports of the first pair being in communication with respective passage portions of the auxiliary intake passage means, and further comprising secondary air supply passage means for supplying a secondary air to an exhaust system of the engine, the suction and exhaust ports of the second pair being in communication with respective passage portions of the secondary air supply passage means.

4,566,423

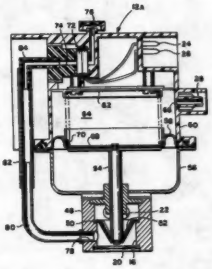
ELECTRONIC FEEDBACK EGR VALVE

Andrew A. Kenny, Roselle; Robert G. Sokalski, Wheaton; Lawrence E. Egle, Itasca, and Daniel C. Stahly, Elmhurst, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 20, 1983, Ser. No. 563,474

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—571 **3 Claims**



1. An improved EGR valve controller comprising:

(a) body means defining an exhaust gas recirculation passage having an inlet, an outlet and a valve seat disposed in said passage intermediate said inlet and said outlet;

(b) a valve member disposed in said EGR passage, said valve member moveable with respect to said valve seat for controlling flow through said passage;

(c) pressure responsive means defining in cooperation with said body means a vacuum signal chamber;

(d) means defining a vacuum connector having a port communicating with said vacuum signal chamber, said connector adapted for connection to a vacuum source;

(e) actuator means operatively interconnecting said pressure responsive means and said valve member for effecting movement of the latter in response to pressure changes in said vacuum chamber;

(f) means defining an EGR flow limiting orifice in said EGR passage upstream of said valve seat;

(g) means defining a pressure tap in said EGR passage intermediate said valve seat and said flow limiting orifice;

(h) pressure transducer means having a sensing port and mounted on said body means remote from said EGR passage with said sensing port vertically at a level above said pressure tap when said controller is installed on an engine;

(i) conduit means extending externally of said body means and interconnecting said pressure tap and said transducer sensing port said conduit means including a section thereof disposed externally of said body means and operative to thermally isolate said transducer port from said pressure top, wherein said transducer means is operative to emit an electrical signal having certain characteristics thereof indicative of the pressure sensed in said tap.

4,566,424

FLEXIBLE COUPLING FOR CARBURETORS

Henry C. Billingsley, Waukegan, and Chester G. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

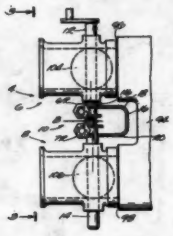
Filed Jul. 30, 1984, Ser. No. 635,568

Int. Cl.⁴ F02B *13/00*

U.S. Cl. 123—583 **26 Claims**

1. A fuel supply assembly comprising a first carburetor having a throttle shaft, and a second carburetor having a separate throttle shaft, said pair of carburetor throttle shafts having axes of rotation in general alignment, and a generally U-shaped coupling for flexibly connecting said pair of separate carbure-

tor throttle shafts so as to accomodate said shafts being axially offset or out of alignment, said coupling including a bight connected to a pair of legs each having a free end including a generally U-shaped member having a pair of arms with apertures for receiving one of said carburetor throttle shafts, each of said U-shaped members also including an arcuate bight having arcuate side portions separated by a centrally located



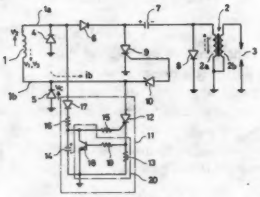
slot communicating with said arm apertures, and also including clamping means for squeezing together said arcuate side portions of said arcuate bight to reduce the opening size of said slot and arm apertures, whereby said pair of arms of each of said U-shaped members engages a separate one of said carburetor throttle shafts so that said pair of carburetor throttle shafts are flexibly coupled for common rotation.

4,566,425

IGNITION SYSTEM OF THE CONDENSOR-DISCHARGE TYPE FOR INTERNAL COMBUSTION ENGINE

Hiroyasu Nitou, Fuji; Kiyoshi Shirai, and Osamu Takahashi, both of Numazu, all of Japan, assignors to Kokusan Denki Co., Ltd., Shizuoka, Japan

Filed Jul. 2, 1984, Ser. No. 626,922
Int. Cl.⁴ F02P *9/00*
U.S. Cl. 123—600 **8 Claims**



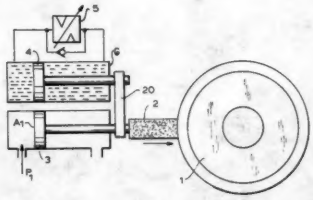
1. An ignition system of the condensor-discharge type for an internal combustion engine, comprising:
- an ignition coil having a primary winding and a secondary winding;
- an exciter coil arranged in a magneto which is adapted to be rotated in synchronism with the rotation of an internal combustion engine, said exciter coil being adapted to generate output voltages each comprising a first half wave voltage of negative polarity, a second half wave voltage of positive polarity and a third half wave voltage of negative polarity in sequence at predetermined angular intervals when said engine is rotated in the positive direction;
- an ignition energy accumulating condensor arranged on the primary winding side of said ignition coil to be charged to have one polarity by said second half wave voltage generated from said exciter coil;
- a discharge control thyristor provided to allow said ignition energy accumulating condensor to be discharged through said primary winding of said ignition coil when it is turned on;
- a turn-on signal supply circuit for supplying a turn-on signal to said thyristor by means of said half wave voltages of negative polarity at the ignition position of said engine;
- a signal control condensor connected to be charged to have one polarity by said second half wave voltage generated from said exciter coil;
- a signal control thyristor provided to substantially short-circuit the output of said exciter coil when it is turned on and adapted to allow the anode-cathode circuit thereof to be biased in the forward direction by said first and third half wave voltages; and
- a discharge circuit for permitting said signal control condensor to be discharged through the gate-cathode circuit of said signal control thyristor.

4,566,426

METHOD AND DEVICE FOR SHARPENING A GRINDING DISK

Heinrich Schleich, Stolberg, and Kemal Yegenoglu, Aachen, both of Fed. Rep. of Germany, assignors to Ernst Winter & Sohn (GmbH & Co), Hamburg, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,976
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233609
Int. Cl.⁴ B24B *53/04*
U.S. Cl. 125—11 R **6 Claims**



2. A device for sharpening and scouring a grinding disk with a grinding medium, comprising a sharpening block operated in contact with the grinding disk, and drive means connected to the sharpening block for applying the sharpening block to the grinding disk with an adjustable feeding velocity and adjustable feeding force, said drive means including a first drive (12) and a second drive (10) coupled to the first drive, said first drive controlling the feeding velocity of the sharpening block and said second drive controlling the feeding force of the sharpening block so that the adjustable feeding velocity is reduced when the feeding force reaches its maximum allowable value.

4,566,427

DEVICE FOR CUTTING BLOCKS OF GRANITE, MARBLE, STONE AND THE LIKE MATERIALS

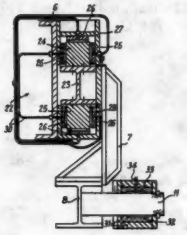
Roger Maréchal, Nuits sur Armancon, and Lucien Jeantet, Enghien, both of France, assignors to Rocamat, Puteaux, France

Filed Dec. 14, 1983, Ser. No. 561,020
Claims priority, application France, Dec. 15, 1982, 82 21040
Int. Cl.⁴ B28D *1/02*
U.S. Cl. 125—16 R **13 Claims**

1. A device for cutting blocks of granite, marble, stone and similar materials, comprising:
- a plurality of sawing blades;
- a blade-carrying frame into which at least two sawing blades are fixed and having slide means for directing horizontal motion of said frame;
- a drive motor unit connected to said blade-carrying frame for displacing said sawing blade in a reciprocating motion,
- a slide-carrying frame of generally rectangular cross-section, upright supports,

a guide unit on each upright support connected to said slide-carrying frame for directing vertical movement of said slide-carrying frame,

said slide means of said blade-carrying frame being adapted to fit within said slide-carrying frame, and



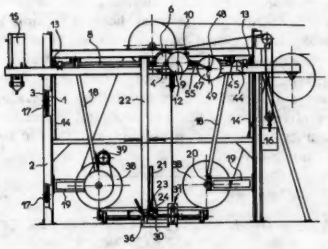
vibration damping means for creating pressure on the top, bottom, and each side of said slide means to urge said slide means away from contact with said slide-carrying frame, thus providing a vibration dampened connection between said slide-carrying frame and said blade-carrying frame, whereby propogation of vibrations to the sawing blades is minimized.

4,566,428

WIRE SAW FOR SHAPING GRANITE AND OTHER STONE

Auguste Roujon, 28, Place Frederic Bompaire, 12100 Millau, France

Filed Apr. 27, 1984, Ser. No. 604,520
Claims priority, application France, Apr. 27, 1983, 83 05479
Int. Cl.[4] B28D *1/30*
U.S. Cl. 125—21 **25 Claims**



1. An apparatus for shaping a stone comprising:

(a) a fixed vertical frame;

(b) a chassis vertically displaceable in said fixed frame and adapted to carry an endless wire band saw for sawing said stone;

(c) a carriage supporting said stone, wherein said carriage is adapted to be displaced;

(d) a means for automatically lowering said movable chassis to saw said stone on said carriage;

(e) a means for automatically displacing said carriage during sawing of said stone;

(f) a guide arm comprising first and second ends, wherein said first end is attached to said chassis and wherein said second end comprises a roller, wherein said guide arm extends downwardly from said chassis; and

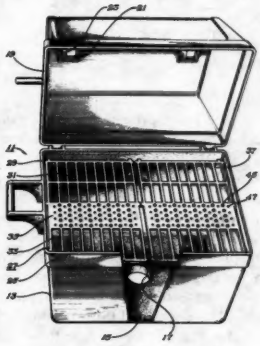
(g) a guide panel attached to said carriage, wherein said guide panel comprises a profile line thereon, wherein said profile line comprises a first end and a second end, wherein said first end is vertically higher than said second end, wherein said roller comprises means for engaging said first end of said profile line before said stone is sawed and for traveling along said profile line from said first end to said second end as said stone is sawed, thereby controlling the velocity of said carriage and said chassis during sawing.

4,566,429

COOKING GRID

Leonard E. Williams, P.O. Box 15448, Fort Worth, Tex. 76119

Continuation of Ser. No. 637,017, Aug. 2, 1984, abandoned. This application Jul. 31, 1985, Ser. No. 761,350
Int. Cl.[4] F24C *15/00*; A47J *27/00*
U.S. Cl. 126—14 **5 Claims**



1. An improved cooking grid for use with a cooking grill having a receptacle for containing a heat source for providing heat and smoke, and support means for engaging edges of the grid to support the grid above the heat source, the grill being of the type having two grids located side-by-side, each grid comprising in combination:

a rectangular cast metal member having integrally formed therein a grid portion and a griddle portion, both located substantially in the same plane;

the grid portion being two rectangular sections located on the front and back of the grid separated by the griddle portion, which is also rectangular, the grid and griddle portions each having a length from one side to the other side that is the same as the grid, one of the grid sections having a width measured from front to back that is greater than the widths of the other grid section and the griddle portion, the griddle portion having a width that is about 20% to 30% the width of the grid, measured front to back;

the grid portion having in each grid section a plurality of rectangular elongated openings separated by support metal, defining rows of openings extending across the length of the grid from one side to the other side, the openings having a total surface area greater than the total surface area of the support metal of the grid portion; the grid section the larger width having more rows of openings than the grid section having the smaller width;

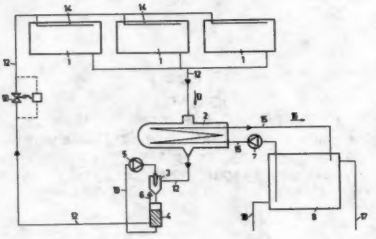
the griddle portion having a plurality of circular apertures separated by support metal, the apertures having a total surface area that is less than the total surface area of the support metal of the griddle portion.

4,566,430

SUN HEATING EQUIPMENT

Paul Vandeplas, Mol, and Lucien Kinnaer, Herentals, both of Belgium, assignors to Studiecentrum voor Kernenergie, "S.C.K." , Brussels, Belgium

Filed Mar. 17, 1983, Ser. No. 476,127
Claims priority, application Belgium, Mar. 17, 1982, 2/59632
Int. Cl.[4] F24J 3/02
U.S. Cl. 126—433 4 Claims



1. A sun heating equipment comprising:

a sun collector which comprises:

an upwardly-directed hollow tightly-closed absorbing plate,

inlet means for fluid into the absorbing plate at a top of this plate, and

outlet means for fluid from the absorbing plate at a bottom of this plate,

said absorbing plate comprising two panels which are secured with the edges thereof to one another and which have depressions extending in a first direction over part of the absorbing plate width and thus forming flow channels extending in this first direction, said flow channels connecting said inlet means with said outlet means inside said absorbing plate, the inner walls of said absorbing plate being moistenable at least in the location of the flow channels,

a line for fluid connecting outside the absorbing plate the outlet means from the absorbing plate to the inlet means into the absorbing plate,

heat-transfer fluid inside said line and inside said flow channels of said absorbing plate, said heat-transfer fluid vaporizing at the temperature reached within said flow channels under sun irradiation of said collector,

a heat exchanger comprising as a primary part a condenser inside said line and a secondary part, said fluid condensing in said condenser,

a vacuum pump directly mounted in said line between said condenser and said inlet means, said vacuum pump being of a type which can pump gaseous as well as liquid fluid,

a venting cylinder between said vacuum pump and said inlet means,

a distributing device which extends in a direction perpendicular to the above-mentioned first direction of the flow channels and which feeds the fluid in liquid form with a limited flow rate to said flow channels, so as to have the moistenable walls regularly irrigated at least at the top with a thin film of liquid fluid, and

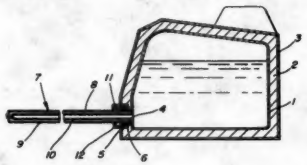
a flow control device between said venting cylinder and said outlet means which lets through a flow rate which can be vaporized in the absorbing plate with a determined sun radiation on said absorbing plate so that the fluid does not fill completely at any height whatsoever said flow channels and is vaporized at least for the most part before reaching the bottom of said absorbing plate.

4,566,431

SPONTANEOUS CIRCULATION TYPE SOLAR HEAT COLLECTOR

Hirosato Takeuchi, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,251
Claims priority, application Japan, Sep. 8, 1983, 58-138438[U]
Int. Cl.[4] F24J 3/02
U.S. Cl. 126—437 2 Claims



1. A spontaneous convection type solar heat collector arrangement comprising:

a reservoir in which a fluid is disposed, said reservoir including an upper portion, a lower portion and an inner surface;

at least one double-tubing type solar heat collecting tube having an open end and a closed end;

at least one connecting opening being provided in the lower portion of said reservoir for mounting the open end of said double-tubing type solar heat collecting tube;

insulating means being operatively positioned around said reservoir for protecting and insulating said reservoir;

said open end of said double-tubing type solar heat collecting tube being positioned in a fixed fluid-tight manner to said connecting opening and being flush with the inner surface of said reservoir for increasing the area of fluid circulation within said reservoir;

an externally threaded member positioned within said connecting opening and an internally threaded nut;

said double-tubing type solar heat collecting tube being disposed within said externally threaded member and said threaded nut for affixing said open end of said double-tubing type solar heat collecting tube to be flush with the inner surface of said reservoir and a packing member operatively positioned between said externally threaded member and said nut for sealing said tube in said opening of said reservoir.

4,566,432

METHOD FOR MASS PRODUCING SOLAR RADIATION REFLECTORS

Isidore F. Sobczak; William C. Cleveland, Jr., both of Santa Ana, and Robert L. Pons, Mission Veijo, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Division of Ser. No. 355,409, Mar. 8, 1982, Pat. No. 4,535,961.
This application Apr. 6, 1984, Ser. No. 597,789
Int. Cl.[4] F24J 3/02
U.S. Cl. 126—438 2 Claims

1. Method for mass producing a solar radiation reflector comprising the steps of:

mass producing many identical reflective facets each having the contour of a portion of a sphere;

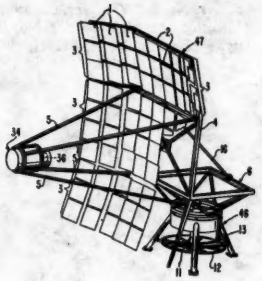
mounting a row of said facets between two horizontal parallel beams such that each facet can partially rotate about a vertical axis and can partially rotate about a horizontal axis;

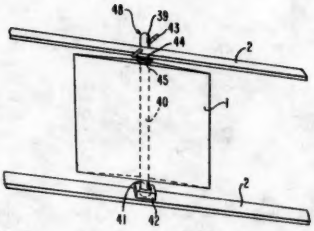
assembling at least one module comprising at least two horizontal beams fixedly positioned with respect to each other;

mounting the modules onto a test fixture;

aligning all of the facets so that they focus radiation from a

distant point upon an aperture a distance from each facet equal to one half the radius of curvature of each facet;
removing the modules from the test fixture;





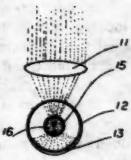
transporting the modules to the site where the concentrator is located; and
affixing the modules onto a reflector support structure so as to make a prefocused solar radiation reflector.

4,566,433

SOLAR COLLECTOR

Robert F. Amundsen, 4051 NE. 13th Ave., Fort Lauderdale, Fla. 33334

Filed Aug. 9, 1984, Ser. No. 639,181
Int. Cl.[4] F24J *2/18*
U.S. Cl. 126—439 **6 Claims**



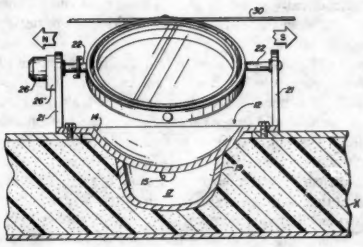
1. A solar collector comprising in combination a transparent conduit, a dark, heat-absorbant fluid within said conduit, an evacuated transparent chamber surrounding said conduit, reflective means on one side of said evacuated chamber, and elongated focusing means aligned with said conduit; said collector being characterized in that said focusing means will focus the sun's rays that it receives into an upper focusing line in said fluid, the rays then passing through to said reflective means which focus said rays back into a second lower focusing line in said fluid.

4,566,434

SOLAR ENERGY COLLECTOR

Leo K. Lindenbauer, P.O. Box 1372, Wickenburg, Ariz. 85358

Filed Dec. 24, 1984, Ser. No. 685,557
Int. Cl.[4] F24J *2/08*
U.S. Cl. 126—440 **4 Claims**



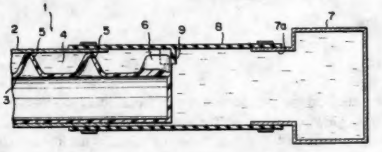
1. A solar energy collector comprising:
a block of heat absorbing material,
at least one lens pivotally mounted on a surface of said block for receiving the rays of the sun,
an indentation comprising a spherical configuration formed in said surface of said block juxtapositioned to said lens,
said indentation providing clearance for the lens as it is pivoted about its mounting axis,
a fluid conducting passageway traversing said block and comprising an expanded portion formfitting around at least a portion of the base of said indentation,
said expanded portion comprising an elongated first segment extending in an east-west direction when said block is exposed to the sun and encompassing a greater volume than a second smaller segment extending in a north-south direction substantially perpendicular to said first segment, said first segment receiving a greater concentration of solar energy each day of the year than said second segment, thereby causing the fluid passing through said passageway to more effectively absorb the heat of the walls of said indentation,
said passageway comprising inlet and outlet pipes extending into and out of said first segment, and
sun tracking means for pivotally rotating said lens to follow the sun.

4,566,435

SOLAR HEAT COLLECTING APPARATUS

Kanichi Kadotani, Atsugi, and Yogaku Iwamoto, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,499
Claims priority, application Japan, Oct. 15, 1981, 56-152221[U]; Oct. 15, 1981, 56-152222[U]; Feb. 19, 1982, 57-21377[U]; Feb. 26, 1982, 57-25812[U]; Apr. 9, 1982, 57-50582[U]
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—443 **4 Claims**



1. A solar-heat collecting apparatus, comprising:
a casing;

a plurality of solar-heat collecting tube units arranged in parallel with each other within the casing, each tube unit comprising a transparent outer tube and an inner tube mounted within said outer tube with a bottom face of said inner tube being in contact with an inner face of said outer tube, both ends of said inner tube being closed to form a hermetically sealed tube, and both ends of said outer tube being open thereby forming a fluid passage between said outer and inner tubes;

a pair of headers mounted in said casing, one of said headers being connected with a first end of each of said outer tubes and the other header being connected with a second end of each of said outer tubes whereby solar-heat collecting fluid is adapted to flow within said fluid passages,

each of said inner tubes having formed thereon a plurality of protrusions arranged at intervals in a longitudinal direction thereof, the height of each of the protrusions being so formed that the diameter of the inner tube at the protrusion is slightly less than the inner diameter of said outer tube,

a plurality of flexible connector tubes each having one end connected to one end of each outer tube and the other end connected to one of said headers,

each of said inner tubes having two stoppers each formed at one of the closed end portions thereof, and

each of said flexible connector tubes having an inwardly projecting slotted retainer having at least one closed end portion for receiving and engaging said stopper thereby preventing each of said inner tubes from rotating as well as from moving in a longitudinal direction thereof.

4,566,436

METHOD FOR APPLYING AND/OR KEEPING AN ISCHAEMIC AREA DURING SURGERY ON THE LIMBS

Johan Loefqvist, Finspång, Sweden, assignor to HB Varix, Finspång, Sweden

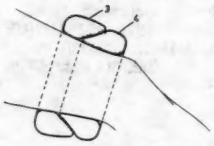
PCT No. PCT/SE82/00303, § 371 Date May 24, 1983, § 102(e) Date May 24, 1983, PCT Pub. No. WO83/01192, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 30, 1982, Ser. No. 499,757

Claims priority, application Sweden, Oct. 2, 1981, 8105819

Int. Cl.⁴ A61B *17/12*

U.S. Cl. 128—1 R **1 Claim**



1. A method of producing an ischaemic region in a limb during surgery, comprising the steps of: rolling onto the limb a proximal elastic annular tube which is filled with a fluid; thereafter rolling onto the limb a distal elastic annular tube which is filled with a fluid; and thereafter rolling said proximal tube partly onto a portion of said distal tube until a position of equilibrium therebetween is reached in which said tubes are positionally locked against movement along the limb.

4,566,437

ENDOSCOPE

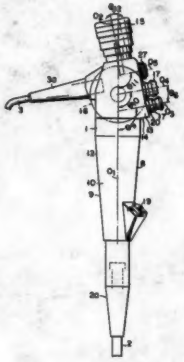
Tatuya Yamaguchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 371,271, Apr. 23, 1982, abandoned. This application May 2, 1984, Ser. No. 605,991

Claims priority, application Japan, May 1, 1981, 56-66541

Int. Cl.⁴ A61B *1/00*

U.S. Cl. 128—4 **4 Claims**



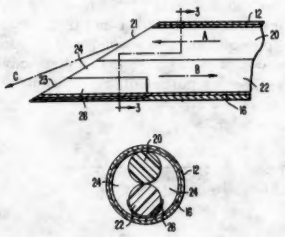
1. An endoscope comprising: an elongated insert section including a distal end portion to be inserted into a body cavity and a proximal end portion; an operation section connected to the proximal end of the insert section, and including a holding portion which is gripped by the third and little finger of a single hand of an operator, a central axis extending along the longitudinal direction of the holding portion and means for permitting operation of the endoscope without requiring unnatural movements of an operator's fingers, said means including a mounting surface located adjacent to the holding portion and within reach of at least one finger of the operator's hand; a rising wall on the operation section between the mounting surface and the holding portion to enable the third finger gripping the holding portion to abut against the rising wall to define a holding position; an eyepiece section mounted on one end portion of the operation section such that the optical axis of the eyepiece section is inclined from the central axis of the holding portion toward the side opposite to that on which the mounting surface is located; said mounting surface having a first end located adjacent to said rising wall and a second end located adjacent to said eyepiece section and being inclined from said first end toward said central axis so that said second end is closer to the central axis than said first end; and operating buttons mounted on the mounting surface to extend outwardly from said inclined mounting surface such that they can be depressed toward said mounting surface in the direction of the central axis of the operating buttons, said inclined mounting surface orienting said buttons such that they are lower in height relative to the central axis of the holding portion as they are positioned further away from the rising wall, said buttons being positioned in a row along the central axis of the holding portion; in which the central axis of the operating buttons are at an angle of between greater than 90° and less than 150° to the central axis of the holding portion wherein the operating buttons are provided on the holding portion in a manner such that the central axis of the operating buttons intersects the central axis of the holding portion at an angle of greater than 90° for access by an operator.

4,566,438

FIBER-OPTIC STYLET FOR NEEDLE TIP LOCALIZATION

Grover J. Liese, 1301 Punch Bowl St., Honolulu, Hi. 96813, and William Pong, 3317 Huelani Dr., Honolulu, Hi. 96822

Filed Oct. 5, 1984, Ser. No. 658,312
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **24 Claims**



1. A fiber-optic stylet for use with a diagnostic or surgical needle, said stylet comprising:

(a) an elongated casing adapted for insertion into a body, said casing having a first end and a second end;

(b) transmitting fiber-optic means comprising at least one transmitting light fiber having one bevelled end extending adjacent said first casing end;

(c) receiving fiber-optic means comprising at least one receiving light fiber having one bevelled end extending adjacent said first casing end, wherein said bevelled end of said transmitting light fiber and said bevelled end of said receiving light fiber are positioned at the same end of said flexible casing; and

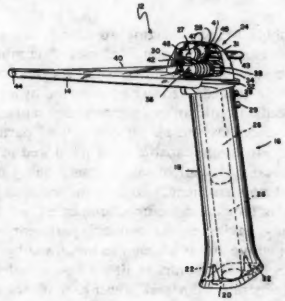
(d) wherein said receiving light fiber is generally cylindrical and has a reflective surface thereon which is located adjacent to said bevelled end of said receiving light fiber and said first casing end.

4,566,439

ACRYLOOPTIC EXAMINATION DEVICE WITH AUXILIARY LIGHT

Kermit H. Burgin, P.O. Box 334, Whitestown, Ind. 46075

Filed Jul. 16, 1984, Ser. No. 631,240
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **8 Claims**



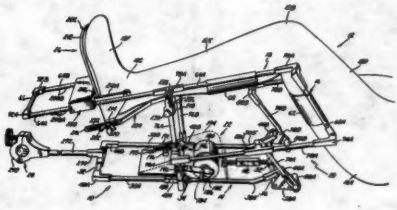
1. A medical examination device comprising an examination head, a base unit having a handle portion and a head portion, a first stationary light source mounted in the head portion for providing light around the examination head, a second light source, and means for movably mounting the second light source in the head portion, the examination head including a portion constructed from an optical wave-guiding material cooperatively aligned with said first light source, such that light from said first light source is directed through said optical wave-guiding portion of said examination head.

4,566,440

ORTHOSIS FOR LEG MOVEMENT WITH VIRTUAL HIP PIVOT

John M. Berner, Golden Valley; Patricia M. Derus, Osseo, and James P. Berner, Richfield, all of Minn., assignors to Empi, Inc., Fridley, Minn.

Filed Feb. 9, 1984, Ser. No. 578,731
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **20 Claims**



1. A leg exercise apparatus for supporting a leg of a patient through a range of movement, the apparatus comprising:

a frame;

femur support means indirectly connected to the frame for supporting an upper portion of the leg through the range of movement;

tibia support means for supporting a lower portion of the leg through the range of movement, the tibia support means being pivotally connected to the femur support means; and

linkage means pivotally connected to the frame, the femur support means and the tibia support means at distinct points thereon for guiding motion of the femur and tibia support means through the range of movement so that the femur support means pivots about essentially a virtual pivot axis which is proximate a hip joint of the patient and is spatially separated from the frame, the femur support means, the tibia support means and the linkage means.

4,566,441

PERCUSSOR SUBASSEMBLY FOR GENERATING GAS BURSTS

Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Co., Temecula, Calif.

Continuation-in-part of Ser. No. 223,355, Jan. 8, 1981, Pat. No. 4,445,503, which is a continuation-in-part of Ser. No. 50,685, Jun. 21, 1979, abandoned. This application Apr. 19, 1984, Ser. No. 602,146
Int. Cl.[4] A61H *9/00*
U.S. Cl. 128—40 **17 Claims**

1. A percussor assembly comprising:

a rigid body member having a gas inlet passageway and a gas outlet passageway, said gas outlet passageway having a restricted portion and an enlarged portion,

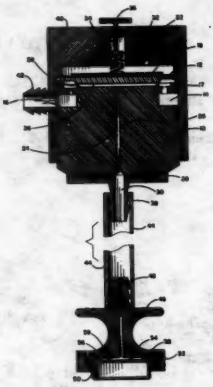
a gas sealing member and biasing means cooperating therewith for urging said gas sealing member to provide a gas-tight seal between said gas inlet and outlet passageways,

a gas pressure chamber between said gas inlet passageway and said gas sealing member,

an applicator pneumatically connected to said enlarged portion of said gas outlet passageway for receiving bursts of gas therefrom,

means for delivering pressurized gas to said gas pressure

chamber sufficient to overcome the biasing force of said biasing means whereby said gas-tight seal is temporarily broken and a burst of gas passes from said gas pressure



chamber through said gas outlet passageway to said applicator; and

a vent passageway communicating from said enlarged portion of said gas outlet passageway to atmosphere.

4,566,442

MASSAGER

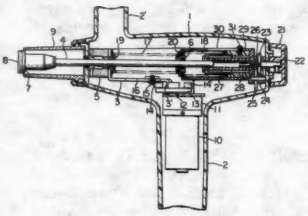
Kenichi Mabuchi, Matsudo, and Masao Yagi, Kashiwa, both of Japan, assignors to Bio Mobuchi Co. Ltd., Japan

Filed Apr. 18, 1983, Ser. No. 486,101

Claims priority, application Japan, Apr. 28, 1982, 57-71724; May 24, 1982, 57-87599

Int. Cl.[4] A61H 7/00

U.S. Cl. 128—52 7 Claims



1. A massager having a device body, a drive unit housed in said device body, a connecting arm driven by said drive unit, energy storage means comprising at least two compression springs connected in series for storing energy when compressed by said connecting arm driven by said drive unit, energy releasing means for rapidly releasing the energy stored in said energy storage means, an actuator driven by said energy storage means and said energy releasing means, a plate member mounted on said actuator, a space guide mounted on said device body for defining an area through which said plate member can travel, and adjusting means for adjusting the amount of energy stored in said energy storage means, characterized in that said adjusting means is constructed so as to adjust the amount of energy stored in said energy storage means and limit the amount of energy stored in at least one of said springs to a predetermined value, said plate member being caused to move to a location apart from a skin surface essentially in contact with said space guide in a state where energy is stored in said energy storage means, and said plate member hits against said skin surface when the energy thus stored is released by said energy releasing means, whereby patting action is repeatedly effected by said plate member onto the skin surface, said actuator being constructed of a retractable rod member, said adjusting means having a spring compression portion, an intermediate spring seat movable in said body and slidably supported by said rod-shaped actuator and connecting said at least two compression springs in series; one end of said compression springs connected in series being supported by said connecting arm and the other end therof by said spring compressing portion; and said compression springs being adapted to be compressed between said connecting arm and said spring compressing portion of said adjusting means when said connecting arm is driven.

4,566,443

AIR BUBBLE HYDROMASSAGING APPARATUS

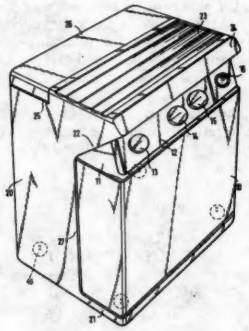
Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Rottweil, Fed. Rep. of Germany

Filed Feb. 28, 1984, Ser. No. 584,513

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311103

Int. Cl.[4] A61H 9/00

U.S. Cl. 128—66 23 Claims



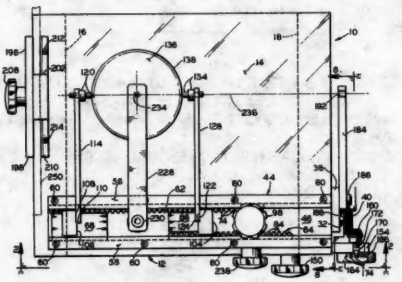
1. An air bubble hydromassaging apparatus, comprising a control unit enclosing functional elements comprising a blower, a heater and having control members thereon, and a foldable air bubble grid adapted to be connected by an air hose to the compressed air outlet of said control unit, said air bubble grid having air channels and air jet orifices, all parts of said apparatus when not in use capable of being stored in a single housing, a vertical side wall of said housing being provided with a recessed compartment, said control members of said control unit being located in the upper region of said housing, and said housing having an interior compartment which is accessible from above and is adapted to be closed by a cover, characterized in that said control unit is constructed as a self-contained unit separate from said housing, that said recessed compartment in said vertical side wall of said housing is formed to serve as space into which said control unit is placed, that said control members of said control unit are disposed in said upper region of an exposed panel of said control unit placed in said recessed compartment, that an overhanging portion of the top of said housing extending over said control unit is shaped to form a seat, and that the remaining area of said housing is closed by said cover which covers the compartment for storing said air bubble grid and said air hose.

4,566,444

PORTABLE ROENTGENOGRAPHIC CEPHALOSTAT

John L. Spolyar, 2769 Homewood Dr., Troy, Mich. 48098

Filed Dec. 28, 1982, Ser. No. 453,949
Int. Cl.[4] G03B 41/16
U.S. Cl. 128—303 B 13 Claims



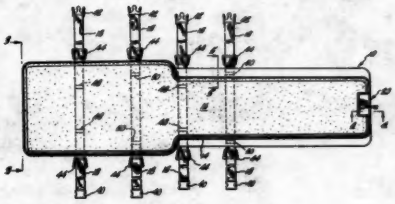
1. A portable cephalostat, comprising portable body means, first means defining a non-resilient fixed reference plane of elevation carried by said body means and against which the back of a patient's head is to be directly located, second means for locating first unexposed film at a preselected elevation below the back of the patient's head and said fixed reference plate of elevation, third means for locating second unexposed film to one side of the patient's head when the back of said patient's head is located against said fixed reference plane of elevation and fourth means for guidingly positioning said patient's head along said fixed reference plane of elevation as to thereby have the mid-sagittal plane of said patient's head situated at a preselected distance from said second unexposed film and for determining the elevation above the plane of said first film of the axis of said patient's auditory canals when the mid-sagittal plane of the patient's head is at said preselected distance, wherein said second means comprises reference surface means carried by said body means, wherein said third means comprises support means carried by said body means, wherein said support means is effective to support said second unexposed film in a generally vertical position generally parallel to said mid-sagittal plane, wherein said fourth means comprises first and second arm-like means, first ear canal locating means carried by said first arm-like means and extending generally toward said second arm-like means, second ear canal locating means carried by said second arm-like means and extending generally toward said first arm-like means, said first and second arm-like means being adjustable through an arcuate path of movement simultaneously toward and away from said fixed reference plane of elevation as to enable said first and second ear canal locating means to be at an appropriate elevation with respect to said fixed reference plane of elevation as to enable the respective reception of said first and second ear canal locating means by the auditory canals of the patient's head, wherein said arcuate path of movement is about an axis of rotation, wherein said axis of rotation is parallel to said fixed reference plane of elevation, said first and second arm-like means also being simultaneously movable toward and away from each other as to thereby respectively generally contain and release said patient's head.

4,566,445

STRETCHER FOR PERSONS WITH SPINAL INJURIES

Richard K. Jelsma, 102 Wampum Rd., Louisville, Ky. 40207; Charles H. Choi, 5279 Kelvin Ave., Apartment 11, Canoga Park, Calif. 91306, and Thomas G. Hynes, 20440 Celtic, Chatsworth, Calif. 91311

Filed Jul. 29, 1983, Ser. No. 518,352
Int. Cl.[4] A61F 5/00; A61G 1/00, 13/00; A47C 19/16
U.S. Cl. 128—70 16 Claims



1. A rigid, portable, radiolucent stretcher suitable for transporting and supporting a traumatized patient and suitable for radiographic examination of a traumatized patient, the stretcher comprising:

(a) an elongated rigid board having a top surface, a substantially flat bottom surface, a torso portion, and a leg portion, the board having a longitudinal centerline and comprising a laminate having a central core of polyimide foam and a skin of graphite reinforced epoxy material, the board having an aluminum equivalency of less than 1 mm;

(b) adjustable straps for holding a patient on the board;

(c) a cushion pad on the top surface of the board, the aluminum equivalency of the pad and board together being less than 1.5 mm;

(d) means for applying traction to a patient and means for securing the traction applying means to the board at the head thereof;

(e) a first set of stops and a second set of stops on the bottom surface of the board, each stop of the first set of stops being separated a first distance from the centerline of the board so the stretcher can sit securely on a first concave surface, each stop of the second set of stops being positioned a second distance from the longitudinal centerline of the board so that the stretcher can sit securely on a second concave surface, the first distance being different from the second distance, and the curvature of the first concave surface being different from the curvature of the second concave surface; and

(f) means for lifting the stretcher.

4,566,446

PENILE PROSTHESIS DEVICE

Terence M. Fogarty, Lakeland, Minn., assignor to Mentor Corporation, Minneapolis, Minn.

Filed Apr. 8, 1983, Ser. No. 483,184
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—79 12 Claims

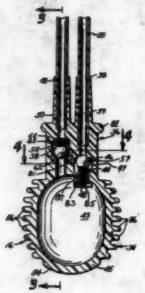
1. A prosthetic penile device comprising:

fluid fillable penile prosthetic means;

a fluid reservoir for storing a fluid;

means for pumping fluid from the reservoir to the prosthetic means including a housing having a longitudinal axis and having a valving section defined along the longitudinal axis for controlling fluid flow between the fluid reservoir and the prosthetic means, the housing of the valving section being made of a flexible deformable material with a fluid supply inlet having a fluid inlet passage fluidly connected to the fluid reservoir and first and second fluid outlets fluidly connected to the prosthetic members, each outlet having a fluid outlet passage, the fluid inlet and the

outlets having check valve means disposed in the fluid passages, the fluid passages of the inlet and outlets being disposed from each other in a substantially triangular configuration in cross-section substantially perpendicular to the longitudinal axis, and a pumping section fluidly communicating with the valving section for pumping the fluid from the reservoir to the prosthetic means, the valving section when in a normal position with the check valve means properly seated permitting fluid flow only from the reservoir, through the pumping section to the



prosthetic means, and when in an inoperable position with the check valve means of the fluid inlet and at least one fluid outlet unseated by deformation of the valving section, permitting fluid to flow back to the reservoir from the prosthetic means through the pumping section and the check valve means;

first conduit means for fluidly connecting the reservoir and the means for pumping; and

second conduit means for fluidly connecting the means for pumping and the prosthetic means.

4,566,447

DROP FOOT CORRECTIVE DEVICE

Bert C. Deis, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 876,298, Feb. 9, 1978, abandoned. This application Jun. 30, 1981, Ser. No. 280,152

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 E **4 Claims**

1. An apparatus for assisting a person having a footdrop type disability, comprising;

a leg attachment member;

an elastomeric support strap secured to said leg attachment member; and

a shoe with a cooperating means for attaching said support strap to said shoe, said means for attaching further comprising a loop, said loop being secured to said shoe of the wearer at a point generally on the forward portion of said shoe and on the lateral side of said shoe, while the other end of said loop is secured to said elastomeric support strap which, in turn, is secured to said leg attachment means at a point on the lateral side of the wearer's leg so that when said apparatus is worn said strap contracts to raise the wearer's foot during the time said wearer is not forcibly extending said strap by the downward extension of said foot and simultaneously effects eversion when said strap operates to raise said foot.

4,566,448

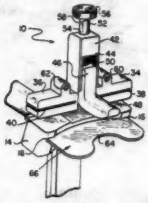
LIGAMENT TENSOR AND DISTAL FEMORAL RESECTOR GUIDE

William L. Rohr, Jr., 1521 Kimberly Woods, El Cajon, Calif. 92020

Filed Mar. 7, 1983, Ser. No. 473,066

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 H **9 Claims**



1. A ligament tensor for tensioning the ligaments in a knee structure during knee surgery, comprising:

a support frame,

first mounting means for mounting said support frame to a tibia;

second means for noninvasively engaging a distal end of a femur and

means interacting between said first mounting means and second means for moving said second means relative to said first mounting means for tensioning the ligaments in said knee structure, said means interacting comprising:

(a) a threaded hole extending through said second means;

(b) a threaded screw threadably extending through said threaded hole and engagable with said first mounting means;

(c) said second means being constrained from rotation about an axis defined by said threaded hole whereby rotation of said threaded screw with respect to said threaded hole in a first direction tensions said ligaments while rotation of said threaded screw with respect to said threaded hole in a second direction contracts said ligaments.

4,566,449

ELEVATED INFANT POSITIONER

Jan E. Smith, 6936 Garden Grove Ave., Reseda, Calif. 91335

Filed Oct. 31, 1983, Ser. No. 547,009

Int. Cl.⁴ A61F *13/00*

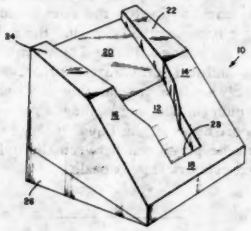
U.S. Cl. 128—133 **12 Claims**

1. A device for safely holding and supporting an infant in either a prone or supine position at a given angle relative to the horizontal comprising:

a first member in the form of an inclined plane havine a first flat surface at a given angle of substantially 30 degrees and adapted to support an infant,

a second bifurcated member having a U-shaped cross-section in contact with said flat surface and having a thick-

ness adapted to prevent vertical and lateral movement of the infant, and



said first and second member being contstructed of a resilient foam material having a density for supporting and restraining the infant.

4,566,450

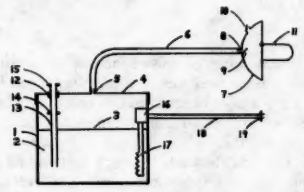
DEVICE TO DISCOURAGE GROWTH OF RESPIRATORY VIRUSES

Harold A. Brossman, Jr., 4249 Kutztown Rd., Temple, Pa. 19560

Filed Feb. 15, 1984, Ser. No. 580,254

Int. Cl.⁴ A61M *15/00*

U.S. Cl. 128—200.11 **1 Claim**



1. An inhalation device for delivering heated and humidified air to a user at an optimum temperature of 108° F. comprising a container for holding a predetermined depth of water, an electric resistance type water heating element mounted in said container below the water level, air-bubbling means in said container, said container having a detachable lid with first and second ports therethrough, said air bubbling means comprising an air intake tube slidably mounted in said first port and having a first end extending above said lid and a second end extending into said container below the water level wherein said air intake tube is adjustable to permit easier inspiration with somewhat less humidification if desired, a breathing tube having a first end attached to said second port and a second end, a cleanable facemask detachably connected to the second end of said breathing tube, said facemask also having inhalation and exhalation valve means for directing the flow of air from said breathing tube, through the facemask and into the surrounding atmosphere, an elastic headband mounted on said facemask for holding the facemask to the head of a user, and thermostat means mounted in said container above the water level for regulating the heater such that air drawn into said container through said air intake tube and bubbled through said water would be delivered to the nose and throat of a user at an optimum temperature of 108° F.

4,566,451

VAPOR INHALATION DEVICE

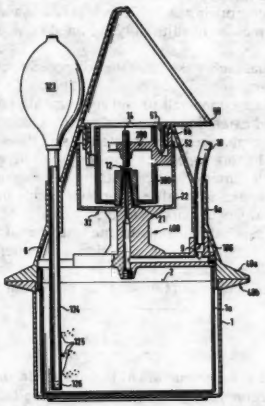
Reinhard Badewien, Veenhusen, Fed. Rep. of Germany, assignor to Plantorgan Werk Heinrich G. E. Christensen KG, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,233

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224849

Int. Cl.⁴ A61M *11/02*

U.S. Cl. 128—200.21 **2 Claims**



1. In a vapor inhalation apparatus including a first container having first means for vaporizing medicated liquid therein and a cover mounted over said first container and having outlet means adapted to communicate with a breathing mask positionable over at least one of the mouth and nose of the user, the improvement comprising:

means associated with said apparatus for enchancing the rate of vaporization of medicated liquid therefrom including conduit means for introducing a gaseous medium under pressure into said apparatus, and second means within said apparatus for atomizing medicated liquid therein and directing it to said outlet means, said atomizing means being in fluid communication with said conduit means,

said atomizing means including a first tubular member having a bore extending therethrough defining a discharge opening situated above the surface level of the medicated liquid in said first container, and a second tubular member cooperating with said first tubular member to define at least one liquid intake opening,

said atomizing means further including a second container having an open upper end mounted on said first tubular member such that said liquid intake opening is adapted to communicate with the bottom interior of said second container,

wherein said second container includes an upwardly axially extending tapered pipe constituting at least a part of said first tubular member, said tapered pipe having said bore formed therethrough and a substantially conical exterior surface in which at least one longitudinal groove is formed which terminates at an upper end of said pipe, said bore of said tapered pipe having one end terminating at the upper end of said pipe and an opposite end in fluid tight communication with said conduit means,

wherein said second tubular member includes a jacket member disposed upon said tapered pipe and having a conical bore formed therethrough complementary with said conical exterior surface of said pipe, said tapered pipe being received in said conical jacket bore such that said at least one longitudinal groove forms a liquid conduit which terminates at the upper end of said pipe, the end of said

liquid conduit proximate to the enlarged end of said tapered pipe constituting said liquid intake opening,

whereby when gaseous medium is introduced through said conduit means into said first tubular member to discharge from said discharge opening, liquid situated within said second container is drawn through said at least one liquid intake opening to be atomized as the gaseous medium is discharged through said discharge opening,

wherein said means for enhancing the vaporization rate of the medicated liquid further comprise baffle means arranged in opposed relationship to said discharge opening,

further comprising a baffle component, and wherein said baffle means are adjustably mounted on said baffle component,

an external jacket skirt member disposed around said jacket member,

a base plate connected to and surrounding said jacket member and extending laterally therefrom, said external jacket skirt member being connected to said base plate, said base plate having openings formed therein communicating with the interior space within said external jacket skirt member and said baffle component being mounted on said external jacket skirt member,

wherein said baffle means are mounted on said baffle component by a threaded connection and wherein said baffle component comprises a sleeve member fixed within said external jacket skirt member by a friction fit.

4,566,452

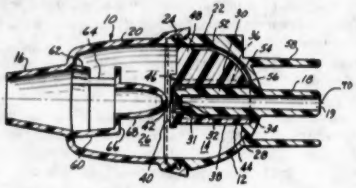
NEBULIZER

James I. Farr, deceased, late of Upland, Calif. (by May S. Farr, administrator), assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 397,669, Jul. 12, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 641,927

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—200.21 14 Claims



1. A nebulizer for converting liquid into aerosol comprising:

a housing having a liquid reservoir formed by a sidewall of the housing and an outlet opening through which aerosol passes;

a cylindrical spray nozzle within the reservoir having an end wall defining a spray orofice and having a liquid inlet means in communication with the reservoir for introducing liquid inlet means includes an outwardly extending arm attached to the spray nozzle providing liquid passage means for drawing liquid in the reservoir into the liquid inlet means, which liquid passage means is open to the reservoir and extends conformingly, openly along and spaced from at least a portion of the sidewall of the housing;

a cylindrical gas nozzle attached to the housing and positioned within the spray nozzle having gas inlet means for introducing gas and an end wall defining a gas orifice, which gas orifice is spaced from and coaxial with the spray orifice, the spray nozzle and gas nozzle defining a liquid passage therebetween extending from the liquid inlet means to the space between the spray and gas orifices; and

means for preventing the aspiration of air through the liquid passage between the spray nozzle and gas nozzle when liquid is present in the nebulizer reservoir and the nebulizer is oriented in either a vertical position or a horizontal position with the liquid passage means extending radially downwardly, said means for preventing aspiration comprising an annular ring on the sidewall in the reservoir extending circumferentially around the cylindrical spray nozzle and providing a fluid seal between the annular ring and the cylindrical spray nozzle for preventing air from flowing between the annular ring and cylindrical spray nozzle, which annular ring includes a gap which provides a liquid port between the liquid passage means and the liquid passage positioned between the cylindrical spray nozzle and cylindrical gas nozzle.

4,566,453

VASCULAR ANASTOMOSIS APPARATUS

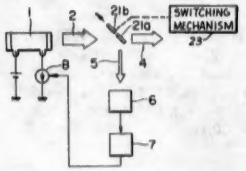
Masafumi Kumano; Ikue Kawashima; Masayuki Hirama, all of Miyagi, and Yasuhiro Tsuji, Saitama, all of Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi and Chugai Seiyaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Dec. 8, 1983, Ser. No. 559,207

Claims priority, application Japan, Dec. 23, 1982, 57-224990

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 4 Claims



1. A vascular anastomosis apparatus, comprising:

carbon dioxide laser means comprising a gas laser tube for emitting a laser beam from one end thereof, said gas laser tube having longitudinally spaced anode and cathode electrodes therein,

said cathode electrode having a first end relatively proximate to said anode and a seond end relatively remote from said anode, with a needle portion at said first end thereof,

said cathode electrode having a tilt portion adjacent said needle portion, said tilt portion having an electron emission surface the area of which increases with increasing distance from said anode;

optical means for (i) collimating said laser beam emitted from one end of said gas laser tube so as to obtain a collimated operation laser beam having a relatively large beam diameter and for (ii) converging the collimated operation laser beam upon a desired area;

means for emitting a visible guide beam;

optical path control means for spatially synchronizing said collimated operation laser beam and said visible guide beam so that the guide beam illuminates the area upon which the laser beam is converged;

means for extracting from said laser beam a monitor laser beam the intensity of which is dependent upon the intensity of said laser beam; and

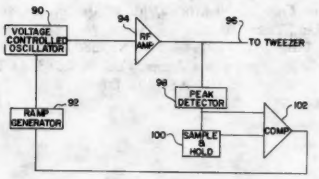
laser output controlling means, including a photosensor for detecting the monitor laser beam, for regulating the intensity of the laser beam output of said carbon dioxide laser means,

whereby a blood vessel may be anastomosed with the operation laser beam by converging the collimated operation laser beam on a desired area of said blood vessel.

4,566,454
SELECTED FREQUENCY HAIR REMOVAL DEVICE AND METHOD

Thomas L. Mehl, 1961 SW. 56th Ave., Plantation, Fla. 33317, and William S. Burdick, Kissimmee, Fla., assignors to Thomas L. Mehl, Pompano Beach, Fla.

Filed Jun. 16, 1981, Ser. No. 274,270
Int. Cl.[4] A61B *17/41*
U.S. Cl. 128—303.13 **21 Claims**



1. A hair removal device, comprising:
(a) radio frequency energy applying means for conveying radio frequency energy to a hair for conduction to the hair papilla
(b) radio frequency energy generating means connected to the radio frequency applying means for producing radio frequency energy at a given frequency and voltage, and
(c) radio frequency selection means connected to the radio frequency energy generating means and to the radio frequency applying means for providing a radio frequency scan over a wide range of hair conduction frequencies and finding a frequency at which the impedance of a given hair to transmission of radio frequency energy at that frequency is substantially lower than for the other radio frequencies in that frequency range.

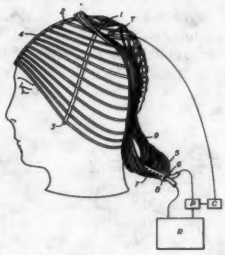
17. A method for removing hair, comprising the steps of:
(a) grasping the hair to be removed at a point adjacent the skin surface with a radio frequency energy transmitting tweezer,
(b) selecting and applying successive radio frequency energy values which are in the range of from 1 to 200 Megahertz to the tweezer for transmission to the hair;
(c) determining the frequency within such range at which the hair impedance is substantially less than for other frequencies,
(d) applying voltage at such frequency through the tweezer to the hair for a period of time, and
(e) removing the hair by withdrawing the tweezer from the skin surface.

4,566,455
SKIN TEMPERATURE CONTROL

Robert W. Kramer, League City, Tex., assignor to H. Mervin Hughes, II, Houston, Tex.

Filed Mar. 27, 1984, Ser. No. 593,861
Int. Cl.[4] A61F *7/02*
U.S. Cl. 128—380 **2 Claims**

1. A scalp cover for controlling scalp temperature by means of a liquid coolant circulating within said scalp cover comprising a series of individual, flexible, elastomeric tubes positioned horizontally on top of and around the scalp in a close, spaced apart relationship with regard to each other and in as close a relationship with the skin as permitted by the hair of the scalp, each tube around the scalp being of a length such that it will circle the scalp twice with an intermediate adjusting loop extending from and free of the back of the scalp; each tube on top of the scalp being positioned in a horizontal spiral; one end of all of said tubes being attached to a manifold providing an inlet for incoming liquid coolant and the other end of all of said tubes being attached to a manifold for the outflow of said liquid coolant; said tubes affixed to flexible elastomeric retainer strips positioned at the front, top and each side of the scalp cover to maintain a variable, spaced apart, relationship of the tubes to accomodate varying scalp sizes; the end portions of each tube positioned around the scalp and the corresponding adjusting loop being affixed to a flexible elastomeric retainer at the back

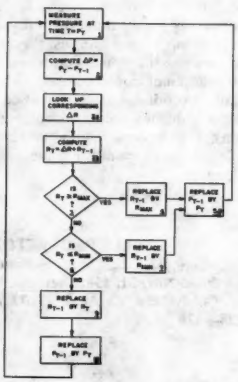


of the scalp cover permitting adjusting and maintaining the circumferential dimension of the tubes around the scalp to accomodate varying scalp sizes.

4,566,456
APPARATUS AND METHOD FOR ADJUSTING HEART/PACER RATE RELATIVE TO RIGHT VENTRICULAR SYSTOLIC PRESSURE TO OBTAIN A REQUIRED CARDIAC OUTPUT

Gerrit Koning, Vries, Netherlands, and Edward A. Schroeppel, Miramar, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Oct. 18, 1984, Ser. No. 662,277
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **29 Claims**



1. An apparatus for pacing a heart in accordance with the heart/pacer rate needed to produce a required cardiac output while the person is exercising, comprising:
a pacer adapted to be implanted in a human body and having a pulse generator and control circuitry therein;
a pacing lead adapted to be implanted in a heart and having a distal electrode adapted to engage and supply pacing pulses to a right ventricle of a heart;
pressure sensing means mounted on said pacing lead for sensing right ventricular systolic pressure; and
said control circuitry further including means for relating said sensed right ventricular systolic pressure and/or the time derivative thereof with the required rate needed to supply a desired cardiac output and for causing said pacer to pace the heart at the required rate when the heart is not naturally paced.

4,566,457
DEFIBRILLATOR CIRCUIT AND ELECTRODES THEREFOR

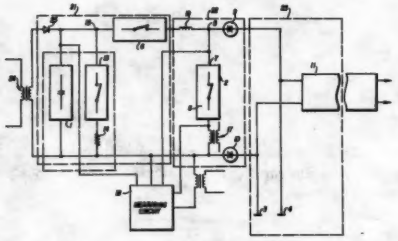
Gunter Stemple, Thorstrasse 13, D-8912 Kaufering, Fed. Rep. of Germany

Continuation of Ser. No. 519,843, Aug. 3, 1983, abandoned. This application Jul. 24, 1985, Ser. No. 757,775

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229134

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D 24 Claims



1. An electrical circuit for generating energy pulses at shock electrodes of a defibrillator, comprising an energy storage means comprising a plurality of capacitors for storing electrical energy, an operating switch between said capacitors and said shock electrodes, said operating switch being closable to discharge the stored energy from the storage means to the shock electrodes in the shock treatment of a patient, a shunt contact means which is connected in parallel with the energy storage means and to a junction on the output side of the operating switch and which is normally closed condition shunts the shock electrodes, means for opening said shunt contact means only for the duration of ths shock treatment, and inductance means, a generator as a power source for said inductance means, said inductance means being connected in series with said shunt contact means, whereby a monitoring voltage signal is produced at said shunt contact means responsive to a high-frequency voltage drop generated at said inductance means, which occurs only when said shunt contact means is closed, and a monitoring means for said monitoring voltage signal.

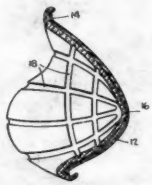
4,566,458
THORAX PROTECTOR

Marc S. Weinberg, 82 Talbot Way, Seekonk, Mass. 02771

Filed Nov. 21, 1983, Ser. No. 553,952

Int. Cl.[4] A41C *3/10*; A61F *13/00*; A41D *13/00*

U.S. Cl. 128—478 12 Claims



1. A thorax protector which comprises:

rigid cup means anatomically contoured to fit over a corresponding breast of a wearer and having a flange means contoured to follow the curve of the thorax of said wearer for distributing forces directed at said thorax protector along the lines of support of the rib cage of said wearer, the contour of said rigid cup means being arranged so that said flange means, starting at the apex of said flange means and moving to the lateral aspect, crosses diagonally across the pectoral muscle of said wearer, turns downward following the fifth rib to the medial aspect and travels upward parallel to the sternum of said wearer, crossing the fourth and third rib, until said flange means again reaches its apex.

4,566,459
ULTRASONIC DIAGNOSIS SYSTEM

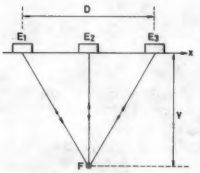
Shinichiro Umemura, Hachioji; Kageyoshi Katakura, Meguro, and Toshio Ogawa, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 580,166

Claims priority, application Japan, Feb. 14, 1983, 58-23548

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 9 Claims



1. An ultrasonic diagnosis system comprising:

a transducer array having a plurality of transducer elements;

transmitting means for driving said transducer elements so that a pulse-like ultrasonic wave is transmitted from said transducer array to an object;

receiving means for receiving reflection signals from said transducer elements, the reflection signals being indicative of reception at said transducer elements of waves reflected from said object;

signal generating means for generating an adjustable signal representative of an assumed acoustic velocity for said object;

indicating means for indicating the assumed velcoity of said object;

focusing means for delaying respective reflection signals in accordance with a delay amount distribution and for summing the delayed reflection signals, the delay amount distribution being determined in accordance with the assumed acoustic velocity so that a receiving ultrasonic beam of said transducer elements is focused to a predetermined focal point; and

display means for displaying an image of said object by converting an output of said focusing means to a visual signal;

whereby an actual acoustic velocity of said object is indicated by said indicating means when said adjustable signal of said signal generating means is adjusted so that an image of a reflector on said image of said object displayed by said display means has the highest intensity.

4,566,460
MEASURING METHOD AND APPARATUS FOR NON-LINEAR PARAMETER OF ACOUSTIC MEDIUM AND ITS APPLICATION

Takuso Sato, Tokyo; Nobuyuki Ichida, Machida, and Hirohide Miwa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 8, 1984, Ser. No. 587,522

Claims priority, application Japan, Mar. 10, 1983, 58-39907

Int. Cl.[4] A61B *10/00*; G01N *29/00*

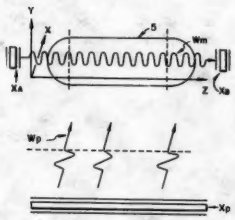
U.S. Cl. 128—660 29 Claims

1. A measuring method for a non-linear parameter of an acoustic medium comprising the steps of:

(A) projecting a probing beam as a probing wave which is a

continuous ultrasonic wave propagating through said acoustic medium;

(B) projecting a pumping wave which is an ultrasonic pulse wave propagating through said acoustic medium to interact with said probing wave;



(C) detecting a phase change in said probing wave which is caused by said pumping wave; and

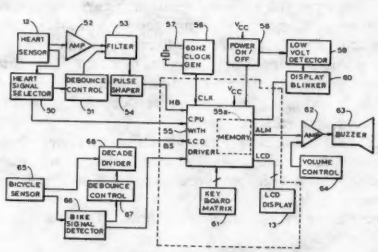
(D) determining the non-linear parameter of acoustic medium from said phase change by deconvolution.

4,566,461

HEALTH FITNESS MONITOR

Michael Lubell, 1504 Jefferson St., and Stephen Marks, 603 Sunderland Rd., both of Teaneck, N.J. 07666

Filed Feb. 15, 1983, Ser. No. 466,671
Int. Cl.⁴ A61B 5/02
U.S. Cl. 128—668 **17 Claims**



1. In a personal fitness level monitor system for monitoring fitness parameters of an animate subject as a function of heat rate during exercise training, of the type comprising heart beat sensor means worn on said animate subject to sense said subject's heart beat; data entry means for entering selected data peculiar to said subject; display means for displaying said entered selected data and one or more fitness parameters calculated on the basis of said entered selected data and the detected heart beats of said subject; and microprocessor means for storing said entered data and calculations exercise heart rate HRE from said detected heart beats and calculating said one or more fitness parameters based on the entered data and heart rate data, said system including timing means for use in measuring the heart rate of the subject on the basis of said detected heart beats; and indicator means providing an indication to said subject of the level of training exercise; the improvement wherein said fitness parameters include a maximal oxygen uptake parameter VO_{2max} as a fitness index; and said microprocessor means includes:

(1) means for establishing an exercise protocol in which the subject exercises at a first relatively low effort level for a first period, and at progressively higher effort levels for corresponding successive periods, means for continuously measuring the heart rate in said microprocessor means based on said detected heart beat of said subject while the latter is exercising at each of said effort levels according to said protocol;

(2) means for halting the exercise protocol when the exercise heart rate HRE of said subject reaches a maximum heart rate HR_M predetermined from said selected data, and means for storing the maximum heart rate HR_M and elapsed time T from the commencement of said exercise protocol until said maximum heart HR_M rate is attained;

(3) means for calculating and storing said fitness index according to a relationship

$$VO_{2max}=aT+b$$

where a and b are experimentally derived coefficients; and

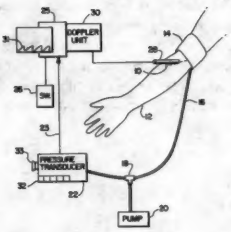
(4) means for causing said display means to display the calculated fitness index VO_{2max}.

4,566,462

VENOUS PRESSURE MEASURING METHOD AND APPARATUS

Herbert F. Janssen, Shallowater, Tex., assignor to School of Medicine Texas Tech. Univ. Health Servcs. Ctr., Lubbock, Tex.

Filed Nov. 21, 1983, Ser. No. 553,951
Int. Cl.⁴ A61B 5/02, 10/00
U.S. Cl. 128—677 **8 Claims**



6. An apparatus for measuring substantially constant venous pressure in a human patient comprising

fluid flow sensor means for producing an electrical signal representative of the flow of liquid through a vein when placed adjacent the skin outside of said vein;

means for exerting increasing pressure on said vein to stop liquid flow therein; and

means connected to said means for exerting pressure for measuring and recording the pressure applied by said means for exerting pressure in rsponse to said signal from said sensor means when said flow stops;

said means for exerting pressure being responsive to the measurement of pressure to stop exerting pressure on said vein for a predetermined short interval after the pressure is measured and recorded and to re-exert pressure thereon for making a new measurement.

4,566,463

APPARATUS FOR AUTOMATICALLY MEASURING BLOOD PRESSURE

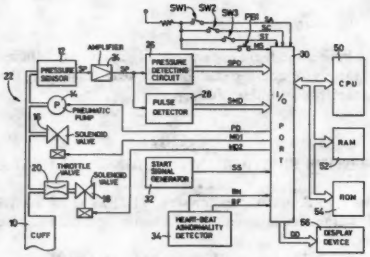
Satoru Taniguchi, Seto; Hideo Nishibayashi, Kakamigahara, and Masahiro Uemura, Komaki, all of Japan, assignors to Nippon Colin Co., Ltd., Aichi, Japan

Filed Apr. 17, 1984, Ser. No. 601,222
Claims priority, application Japan, Apr. 25, 1983, 58-072678
Int. Cl.⁴ A61B 5/02
U.S. Cl. 128—682 **12 Claims**

1. An apparatus for automatically measuring blood pressure of a living subject, including an occluding device having a cuff for applying a pressure force to a body member of the subject, and blood-pressure determining means for determining the

blood pressure according to a variation in a pulse wave generated at the body member in relation to a change in the pressure force applied thereto by the occluding device, said apparatus comprising:

abnormality detecting means for monitoring a blood circulatory system of said subject for normal functioning thereof, and generating an abnormality signal representing an abnormality associated with said blood circulatory system;



control means, responsive to said abnormality signal, for actuating said occluding device to apply said pressure force to said body member, and causing said blood-pressure determining means to execute a predetermined series of blood-pressure measuring steps to measure the blood pressure, thereby permitting an automatic measurement of the blood pressure of the subject when the blood circulatory system is found abnormal by said abnormality detecting means.

4,566,464

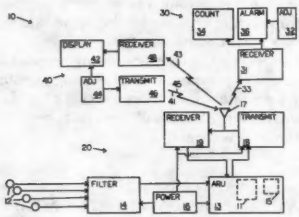
IMPLANTABLE EPILEPSY MONITOR APPARATUS

Vincent A. Piccone; John N. Piccone; Louis A. Piccone, all of 377 Gansvoort Blvd., Staten Island, N.Y. 10314; Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. LeVeen, 3-3 Woodlake Rd., Albany, N.Y. 12200

Filed Jul. 27, 1981, Ser. No. 286,851

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—732 **4 Claims**



1. A personal epilepsy seizure warning system comprising an implantable monitor meand adaptable to detect brain potentials indicating the onset of an epileptic seizure at a predetermined sensitivity level, said monitor means further comprising means to transmit an alarm signal when said brain potentials indicating an epileptic seizure are detected, and an external warning means adapted to receive said alarm signal and notify the patient when said alarm signal is received, and further including external program transceiver means adapted to adjust said predetermined sensitivity level.

4,566,465

PROBE WITH VARIABLE GEOMETRY FOR MEASURING THE RADIAL STRAINS IN A SPHINCTER OF A LIVING ORGANISM

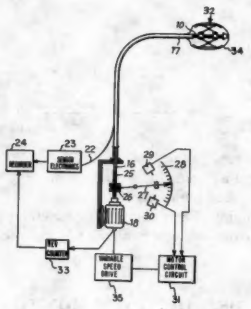
Pierre J. Arhan, Paris, and Marc R. Héro, Pontoise, both of France, assignors to Universite Rene Descartes Paris V, Paris, France

Filed Apr. 6, 1984, Ser. No. 597,535

Claims priority, application France, Apr. 7, 1983, 83 05678

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—778 **10 Claims**



1. A probe having a variable width for measuring the radial strain of a sphincter of a living organism, comprising:

a rotatable threaded rod;

at least three pressure sensors;

at least three flat rigid elements each carrying one of said pressure sensors for engaging and for measuring the radial strain of said sphincter of a living organism;

a pair of threaded block elements carried by said threaded rod, said block elements including inner threads such that the blocks move in opposite directions along said threaded rod during rotation thereof;

means for connecting said rigid elements to said block elements such that rotation of said threaded rod causes the distance between said threaded rod and said rigid elements to vary;

motor means for rotating said threaded rod at a constant rate; and

means responsive to said pressure sensors for indicating the radial strain of said sphincter of a living organism.

4,566,466

SURGICAL INSTRUMENT

Dale B. Ripple, 1130 Singingbrook Dr., NW., and David W. Smith, 5685 Arlington Ave., NW., both of Massillon, Ohio 44646

Filed Apr. 16, 1984, Ser. No. 600,970

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—781 **12 Claims**

1. A set of surgical instruments for sizing a graft to be removed from the iliac crest for insertion into a space between distracted vertebral bodies, each of said instruments including, a template head and handle means for inserting the head into the the space formed between the distracted vertebral bodies, said template head having a generally rectangular configura-

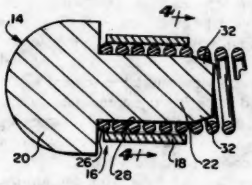
tion formed by a pair of spaced parallel flat surfaces separated a predetermined distance by a generally flat planar outer end surface, an inner end surface, and a pair of flat planar side surfaces connected to the outer end surface by rounded corners to provide a desired thickness for each template head for determining the width of the space between the vertebral bodies with the thickness of the individual template heads varying in thickness with respect to each other to provide a range of template head thicknesses.

9. The set of surgical instruments defined in claim 1 in which the handle means is a cylindrical-shaped member having a knurled outer surface; and in which said handle member is connected to the head by a cylindrical rod.

4,566,467
ELECTRICAL CONNECTION BETWEEN COILED LEAD CONDUCTOR AND LEAD TIP ELECTRODE

Abel DeHaan, Pembroke Pines, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jun. 20, 1984, Ser. No. 622,669
Int. Cl.⁴ A61N *1/04*
U.S. Cl. 128—784 **40 Claims**



1. A method for manufacturing a tip electrode assembly for a pacing lead including the steps of: providing bared end coils of a coiled conductor of the pacing lead; forming a shank of a tip electrode with at least two circumferentially spaced, axially extending sharp edges; positioning the shank of the tip electrode adjacent a distal end of said bared end coils; positioning a conductive sleeve of a transitional, temperature activated, mechanical memory metal material between said distal end of said bared end coils and said shank, said sleeve being formed to have a predetermined initial inner diameter greater than an outer diameter of said coils; positioning said bared end coils around said shank and said sleeve around said bared and coils surrounding said shank; and changing the temperature of said sleeve made of the transitional, temperature activated, mechanical memory material thereby to shrink said sleeve and force said bared end coils into embedded engagement with said sharp edges as the diameter of said sleeve is shrunk to effect radially inward movement of said coils into the shank edges to form a substantially low impedance, oxide-free and gas-tight electrical connection between said coils and said shank.

4,566,468
PROCESS AND SYSTEM FOR MAKING A BLENDED TOBACCO PRODUCT

Leroy R. Sachleben; Kevin R. Korte; Daniel D. Snyder, all of Louisville, Ky., and Terry L. Allen, North Augusta, S.C., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

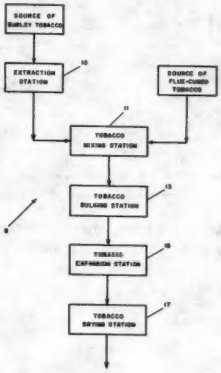
Filed May 25, 1983, Ser. No. 498,000
Int. Cl.⁴ A24B *15/24, 15/26*
U.S. Cl. 131—297 **34 Claims**

1. A process for making a blended tobacco product of at least two different tobaccos, said process comprising the steps of:

extracting soluble material from a first one of the two different tobaccos by dissolution;

mixing the first tobacco resulting from said extraction step with the second one of the two different tobaccos;

expanding the tobacco mixture resulting from the mixing step; and,



drying the expanded tobacco mixture to a moisture content suitable for a smoking product.

4,566,469
PROCESS FOR DISSIMILATORY DENITRIFICATION OF TOBACCO MATERIALS

Bernard A. Semp, and Daniel M. Teng, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 900,044, Apr. 25, 1978. This application Aug. 13, 1979, Ser. No. 66,273
Int. Cl.⁴ A24B *3/14, 15/02*
U.S. Cl. 131—308 **21 Claims**

1. A process for dissimilatory denitrification of nitrate in tobacco material comprising:

a. inoculating tobacco material with a sufficient amount of a microorganism capable of dissimilatory denitrification to provide an initial concentration of at least 1×10^7 cells per milliliter of said microorganism; and

b. incubating the inoculated tobacco material with agitation under conditions such that nitrate in the tobacco material is reduced to nitrogen gas via dissimilatory denitrification while maintaining a vaccum up to a maximum level of about 500 mm Hg.

4,566,470
TOBACCO LEAF PROCESSING

Warren A. Brackmann, Mississauga, Canada, assignor to Rothmans of Pall Mall Canada Limited, Don Mills, Canada

Filed Oct. 27, 1983, Ser. No. 545,859
Claims priority, application United Kingdom, Oct. 28, 1982, 8230812
Int. Cl.⁴ A24B *3/18*
U.S. Cl. 131—312 **7 Claims**

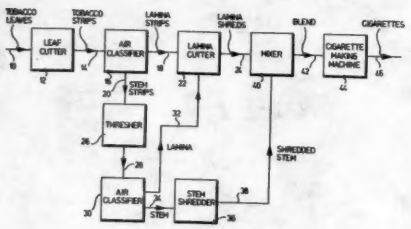
1. A method of processing leaf tobacco, which comprises:

cutting said tobacco leaf into a plurality of tobacco strips;

classifying said plurality of strips into a heavier fraction and a lighter fraction;

threshing said heavier fraction strips to separate stem material from lamina material; and

cutting said lighter fraction strips and said lamina material to form lamina shreds,



said tobacco leaf being oriented so that the first-mentioned cutting step is effected longitudinally of the leaf.

4,566,471

CUTTING APPARATUS

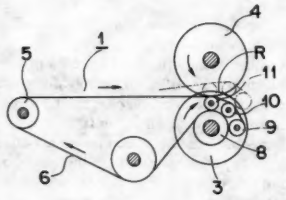
Takeo Kumasako, Tokyo; Kiyomi Sato, Hiratsuka; Akira Kawakatsu, Hiratsuka; Akinori Sato, Tokyo, and Isamu Mamiya, Tokyo, all of Japan, assignors to The Japan Tobacco & Salt Public Co. and Tokyo Shisetsu Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,369

Claims priority, application Japan, Dec. 24, 1982, 57-225968

Int. Cl.[4] A24B *3/07*; B26D *7/06, 1/24*; B23D *19/04*

U.S. Cl. 131—317 **10 Claims**



1. A cutting apparatus comprising:

a feed belt conveyer including a plurality of parallel narrow endless belts, said feed belt conveyor having a head section and a tail section;

a pulley provided at said head section;

a plurality of lower rotary cutting blades coaxially mounted on said pulley and having a diameter greater than that of said pulley, each said lower rotary cutting blade projecting from between adjacent narrow endless belts of said feed belt conveyor; and

a plurality of upper rotary cutting blades provided above said lower rotary cutting blades, said lower and upper rotary cutting blades defining therebetween an overlap section such that each upper rotary cutting blade partly overlaps a lower rotary cutting blade corresponding thereto, said narrow endless belts of said feed belt conveyor being led to proceed from said pulley at said head section while not passing beyond outfeeding edges of said lower rotary cutting blades and back to said tail section after said narrow endless pass said overlap section.

4,566,472

APPARATUS FOR APPLYING A COLOR MEDIUM TO HAIR

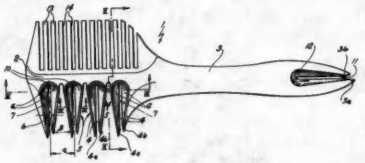
Siegfried Mueller, Bauschengasse 14, and Eberhard Schäfer, Hammerbuehl 23, both of 7737 Bad Duerrheim, Fed. Rep. of Germany

Filed Jun. 1, 1983, Ser. No. 499,929

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221410

Int. Cl.[4] A45D *24/22*

U.S. Cl. 132—112 **17 Claims**



1. A hair coloring apparatus, comprising a color-applying comb having several teeth arranged on a comb back and having gaps which lie between said teeth, wherein said teeth are spaced by relatively large distances from one another, are substantially triangularly shaped in a top view, and taper toward their tips, wherein said gaps are substantially triangularly shaped in a top view and taper toward said comb back, wherein each said tooth has in an enlarged part thereof near said comb back a color chamber which is a recess provided in an upper side surface of said comb, and wherein each said tooth has a narrow slot therein which extends substantially perpendicular to said comb back from the tooth tip into the color chamber, said slot opening through a lower side surface on the opposite side of said comb from said upper side surface.

4,566,473

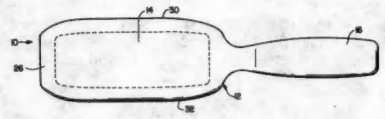
AIR BAFFLED HAIRBRUSH

Richard M. Hyman, 18 Glendale Ct., Iowa City, Iowa 52240

Filed Apr. 5, 1983, Ser. No. 482,065

Int. Cl.[4] A45D *24/16*

U.S. Cl. 132—120 **12 Claims**



1. A hairbrush comprising

an elongated rigid brush block having a face surface,

a plurality of bristles mounted on said brush block and projecting outwardly from said face surface,

a pair of elongated air baffles formed on and extending longitudinally of said brush block,

said air baffles being located on adjacent block side edge portion of said face surface in outwardly spaced relation to said bristles and extending from said face surface in outwardly diverging relation to one another and cooperating with said face surface to form a trough extending longitudinally of said brush block for confining and redirecting the flow of air from a separate blow dryer.

4,566,474
CRUTCH

Edmund T. Burke, R.R. #2, Kilworthy, Ontario, Canada (Poeigo)

Filed Apr. 13, 1984, Ser. No. 600,137
Int. Cl.[4] A61H 3/02
U.S. Cl. 135—69 1 Claim

1. An adjustable crutch generally of the wishbone shape comprising:

(a) a top portion having a pair of spaced vertically extending support members, each support member having two ends, an upper and lower end, said pair of spaced support members being spaced from each other at their upper ends by a horizontally extending underarm rest, the lower end of each support member being spaced from the lower end of the other support member, each support member carrying a plurality of apertures therethrough, aligned with the apertures in the oppositely spaced support member;

(b) a bottom portion having a pair of vertically extending support members, spaced apart at the top of the bottom portion, each support member carrying a plurality of apertures therethrough aligned with the apertures in the oppositely spaced support member, the vertically extending support members converging together towards the bottom to be affixedly joined together in a "Y-shaped" configuration whereby only one of the support members continues down to form the foot of the crutch of the same diameter and material as the one support member, comprising the bottom of the "Y-shaped" configuration;

(c) the top portion and the bottom portion being telescopical with respect to one another so as to permit adjustment of the height of the crutch and permit alignment of the apertures through the support members, and;

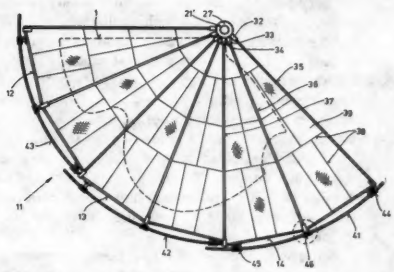
(d) a handgrip having means for co-operating with the apertures through the support members whereby the height of the crutch and the position of the handle may be adjusted in a single adjustment of affixedly joining the handgrip between the pair of telescoped members.

4,566,475
OUTDOOR RECREATION AREA COVER

Josef Wund, Ifenstrasse 12, D-7990 Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,875
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334371; Jun. 30, 1984, 3424160
Int. Cl.[4] E04H 15/26, 15/60; E04B 1/346; A47F 5/02
U.S. Cl. 135—99 14 Claims

1. A covering device comprising a pylon support, a plurality of circular segment-shaped cover members having inner apices pivotally supported on said pylon support and outer ends, roller means connected to said cover members at a spaced location from said pylon support and supporting said cover members for rotation around said pylon support, said cover members being foldable one under the other, when contracted, and being spreadable fan-like into an extended position, a support member for each of said cover members rotatably

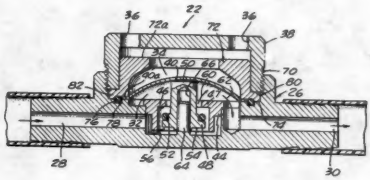


mounted on said pylon and gimbal suspension means for each of said cover members rotatably engaged on said support members.

4,566,476
FLOW CONTROL DEVICE

Merton R. Fallon, Thousand Oaks, Calif., and Thomas Clements, Ambler, Pa., assignors to Draft Systems, Inc., Northridge, Calif.

Filed Mar. 29, 1985, Ser. No. 717,446
Int. Cl.[4] F16K 17/14
U.S. Cl. 137—71 10 Claims



1. A flow control device for interconnection between a source of pressurized fluid and a container to be pressurized, comprising:

(a) a housing having an inlet adapted to communicate with the source of pressurized fluid and an outlet adapted to communicate with the container, said housing having a pressure chamber in communication with said inlet and said outlet and a vented chamber in communication with atmosphere;

(b) a frangible membrane separating said pressure chamber and said vented chamber, said frangible membrane being adapted to fail when a predetermined pressure is reached within said pressure chamber; and

(c) valve means disposed in said housing in cooperative association with said frangible membrane for blocking the flow of fluid from said inlet into said pressure chamber when said frangible membrane fails.

4,566,477
FLUID FLOW CONTROL APPARATUS

Charles A. Barker, Indianapolis, and Jim L. Rau, Lafayette, both of Ind., assignors to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 361,851, Mar. 25, 1982, abandoned.
This application Oct. 9, 1984, Ser. No. 659,026
Int. Cl.[4] F15B 13/06
U.S. Cl. 137—101 6 Claims

1. A priority valve for controlling fluid flow from a source

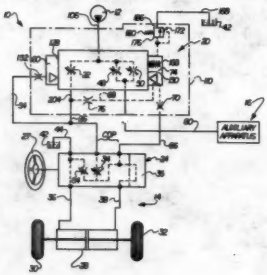
of fluid to a steering circuit and an auxiliary circuit, said priority valve comprising

a housing having an inlet port for connection to a source of fluid, a priority port for connection to a steering circuit, an auxiliary port for connection to an auxiliary circuit, and a pilot port for connection with a pilot flow control means in the steering circuit, the housing also having a plurality of fixed valve surfaces that at least partially define a fluid chamber communicating with said inlet port,

means defining a pilot conduit communicating with said pilot port for directing a pilot flow of fluid thereto,

a valve member disposed and movable in said fluid chamber to control fluid flow between said inlet port and said priority and auxiliary ports, said valve member having a plurality of axially extending lands which cooperate with said fixed valve surfaces to define a plurality of variable size orifices,

said plurality of axially extending lands comprising a first land cooperating with one of said fixed valve surfaces to define a first one of said plurality of variable size orifices communicating with said inlet port and said priority port, a second land cooperating with another of said fixed valve surfaces to define a second one of said plurality of variable size orifices communicating with said inlet port and said auxiliary port, and a third land cooperating with a third one of said plurality of fixed valve surfaces to define a



third one of said plurality of variable size orifices communicating with said inlet port and said auxiliary port and establishing a fluid flow parallel to the fluid flow through said second variable orifice, said second and third lands defining an axially extending circumferential groove in said valve member between said second and third lands that communicates said third variable orifice with said auxiliary port,

means for exposing a first end portion of said valve member to a first fluid pressure,

means for exposing a second end portion of said valve member to a second fluid pressure which is taken from the pilot flow of fluid,

said valve member being movable in a first direction under the influence of a variation in a difference between the first and second fluid pressures to decrease the size of said first variable orifice and to open said second variable orifice, thereby decreasing flow to said priority port and increasing fluid flow to said auxiliary port,

said valve member being movable farther in the first direction under the influence of a further variation in the difference between the first and second fluid pressures to decrease further the size of said first variable orifice, to increase the size of said second variable orifice, and to open said third variable orifice, thereby further decreasing flow to said priority port and increasing flow to said auxiliary port.

4,566,478

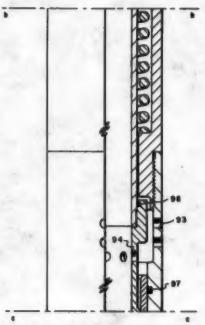
WELL SAFETY AND KILL VALVE

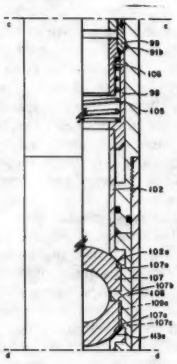
Thomas M. Deaton, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 372,134, Apr. 27, 1982, abandoned. This application May 24, 1984, Ser. No. 613,439

Int. Cl.⁴ F16K *17/00*

U.S. Cl. 137—112 **10 Claims**





1. A valve device for use in tubing above a packer set in casing above a formation in a well comprising:

a. a housing connectable in well tubing and having a longitudinal flow passage therethrough and a flow passage through said housing wall intersecting said longitudinal flow passage;

b. an operator, including an upper operator tube, having a piston thereon, said piston sealingly engaging said housing and forming a variable volume chamber therewith, a lower operator tube connected to said upper operator tube, said operator tubes mounted for longitudinal movement in the housing, and a spring disposed around said upper operator tube in said housing between a shoulder in the housing and said piston;

c. an upper sleeve valve, controlling flow through the wall flow passage between the valve device exterior and the longitudinal flow passage, including a resilient seal in the housing below the wall flow passages, sealingly engaging the lower operator tube and at least one port in the lower operator tube;

d. a lower ball valve controlling flow through the longitudinal flow passage, having upper and lower seats and a valve ball member therebetween, said seats slidably sealed at substantially equal diameters in the housing and sealingly engageable with the valve ball member at seal diam-

eters larger than said equal seat-housing seal diameters; and

e. a releasable lock in said housing, for locking the lower valve closed after upward movement of the operator, closing said lower valve and opening the upper valve, said lock including a profiled recess in the housing, at least one dog pivotally mounted in an extension of the lower valve upper seat and profiled to engage said housing recess, a spring biased dog expander slidably mounted in said upper seat extension, said lock releasable during downward movement of the operator opening said lower valve and closing said upper valve.

4,566,479

SPOOL MEMBER OF A MULTI-WAY-VALVE

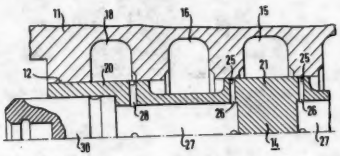
Hermann J. Rotte, Partenstein, and Emil Bögl, Sulz-Hopfau, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,715

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309065

Int. Cl.⁴ F15B *13/04*

U.S. Cl. 137—312 **2 Claims**



1. A multi-way-valve comprising a valve housing having a bore formed therein intersected by a pressure port, an operating port, and a reservoir port, a valve spool slidably supported within said bore and having a pair of axially spaced lands with an interposed relief for selectively communicating said pressure port with said operating port or said operating port with said reservoir port, the improvement comprising a pair of annular grooves formed in said lands adjacent to said relief, a blind radially extending bore extending through said spool and radially extending passages extending from said annular grooves to said blind bore, said radially extending passages having a substantially greater diameter than the width of said annular grooves.

4,566,480

MEDICAL STOPCOCK VALVE ASSEMBLY

Allan M. Parham, 302 Plantation Dr., New Bern, N.C. 28560

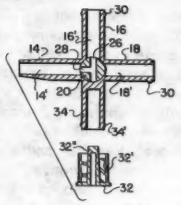
PCT No. PCT/US83/01709, § 371 Date Jun. 14, 1984, § 102(e) Date Jul. 1, 1984, PCT Pub. No. WO84/01805, PCT Pub. Date May 10, 1984

Continuation-in-part of Ser. No. 438,410, Nov. 1, 1982, abandoned. This PCT application Oct. 28, 1983, Ser. No. 648,238

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 137—271 **37 Claims**

1. In a medical stopcock valve assembly of the type including a valve body having formed therein a plurality of fluid ports, an operating member in said valve body for selectively controlling fluid communication through said valve body between said fluid ports, and at least one closure means having engagement means formed for selective engagement with said valve body at at least one of said fluid ports for closure thereof, the improvement comprising blind closure-receiving means formed integrally on said valve body closed to operative communication with said fluid ports and formed for engagement by a stored closure means having engagement means identical to said at least one closure means to receive and retain said stored closure means for storage thereof when not in portclosing use



to prevent loss thereof and to provide ready access thereto for portclosing use when desired.

4,566,481

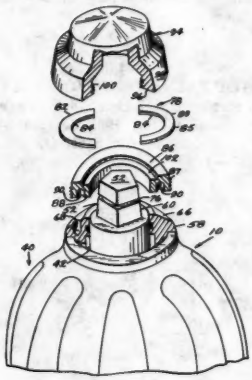
TAMPERPROOF FIRE HYDRANTS

Wilbur R. Leopold, Jr., and Dennis W. Humes, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed May 22, 1985, Ser. No. 736,830

Int. Cl.⁴ F16K *35/06*; E03B *9/06*

U.S. Cl. 137—296 **9 Claims**



1. A tamperproof fire hydrant comprising:

a barrel member having an open end portion;

valve means positioned in the lower portion of said barrel member;

reciprocating valve stem means extending from said valve means upwardly within said barrel member and having a threaded end portion;

a top closure member secured to the open upper end of said barrel member, said top closure member having an aperture therethrough with an inwardly extending shoulder therein and threads positioned outwardly of said shoulder;

a rotatable operating nut having a polygonal end portion projecting out of the aperture of said top closure member, said rotatable operating nut having an exterior flange thereon operatively abutting said shoulder in said aperture of said top closure member, said rotatable operating nut having threads thereon cooperating with the upper threaded end portion of said valve stem means whereby said nut member can be rotated to actuate said valve stem means;

a tubular hold-down nut threaded into said apertured top closure member and operatively abutting said exterior flange of said operating nut to position said operating nut against axial movement, said hold-down nut having a portion extending out of said top closure member, said

outwardly extending portion having a frusto-conical outwardly facing surface provided with at least two inwardly axially extending and circumferentially spaced holes;

a retaining ring groove extending about said polygonal end portion of said operating nut;

an annular retainer member having an inside diameter sufficient to loosely fit over and rotate relative to said polygonal end portion of said operating nut, said annular retainer member having a bottom face with at least a pair of upwardly axially extending and circumferentially spaced holes, said retainer member further having an external peripheral threaded surface and an upper face with an annular recess extending about an inner periphery thereof;

a retaining means loosely carried in the annular groove on said polygonal upper portion of said operating nut, said retaining means bearing loosely in said recess on said upper face of said retainer member to prevent axial movement of said retainer member outwardly therefrom; and

a dome shaped cap covering the operating nut having a skirt depending downwardly therefrom with an interior threaded surface for cooperating with the exterior threaded surface of said retainer member, said dome shaped cap when threaded onto said retainer member being freely rotatable relative to the polygonal portion of said operating nut with a lower edge of said skirt permitting only limited access to said polygonal end portion, said holes in said hold-down nut and said holes in said retainer member.

4,566,482

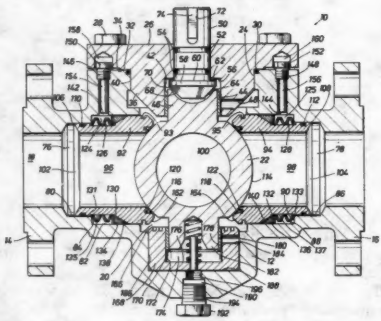
TOP ENTRY TRUNNION BALL VALVE

Gerald A. Stunkard, P.O. Box 748, Gladewater, Tex. 75647

Filed Jun. 27, 1985, Ser. No. 749,436

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—315 **37 Claims**



1. A top entry ball valve, comprising:

(a) body means defining a valve chamber and flow passage means intersecting said valve chamber, said body means forming an access passage to said valve chamber oriented substantially transverse to said flow passage means;

(b) bonnet means being removably connected to said body means and forming a sealed closure for said access passage means;

(c) a generally spherical valve member being rotatably supported within said valve chamber and defining a spherical sealing surface and a flow port and being rotatable substantially 90° between the open and closed positions thereof;

(d) a pair of seat members being movably disposed in sealed relation within said body means and having sealing portions thereof in sealing engagement with said spherical surface of said valve member;

(e) means urging said seat members into sealing engagement with said valve member; and

(f) a bearing assembly disposed within said valve body and surrounding at least a portion of said valve member, said bearing assembly comprising seat retractor means disposed within said valve body and being controllably movable into engagement with said seat members, movement of said seat retractor means inducing retraction of said seat members away from said valve member sufficiently that said valve member is clear for insertion into and extraction from said valve chamber through said access passage.

4,566,483

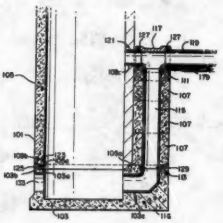
DROP MANHOLE PRECAST ENCASEMENT

Jack Ditcher, Langhorne, Pa., assignor to A-Lok Products, Inc., Tullytown, Pa.

Filed Oct. 15, 1984, Ser. No. 660,650

Int. Cl.[4] E02D *29/12*

U.S. Cl. 137—372 **14 Claims**



1. A supporting assembly of precast modular sections for use in surrounding and supporting the vertical pipe section in a drop manhole assembly, said vertical pipe section extending between the base of the drop manhole assembly and a supply conduit external to said manhole assembly and along the exterior of the drop manhole assembly for delivering effluent to the interior of said drop manhole assembly base, said supporting assembly comprising:

a plurality of precast modular sections arranged to be stacked one upon the other along the exterior of the manhole assembly;

each of said sections having a substantially U-shaped configuration and having mating means along the upper and lower surfaces thereof wherein the mating means of the lower surface of each section engages and interfits with the mating means of the upper surface of the adjacent section, said mating means cooperating to facilitate initial alignment between stacked sections and prevent the stacked sections from being laterally slidably separated from one another.

4,566,484

LIQUID LEVEL CONTROL APPARATUS

Daniel Silverman, Tulsa, Okla., assignor to William R. Walters, Cleveland, Okla.

Filed Dec. 28, 1984, Ser. No. 687,578

Int. Cl.[4] F16K *21/18, 31/128*

U.S. Cl. 137—403 **7 Claims**

1. In a non-float operated, double diaphragm apparatus for controlling the flow of a pressurized liquid from the end of a pipe or conduit into a tank or receptacle open to the atmosphere to maintain a constant given level therein,

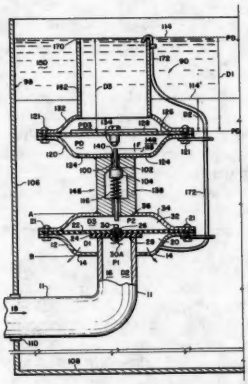
(a) first valve means having a first flange on said conduit near its end, and a second flange having an axial opening, clamping a first diaphragm therebetween, said first diaphragm having a first small opening of first selected size through its center, and adapted to close off the end of said conduit except for said first small opening;

(b) a short axial pipe attached and sealed at its first end to said

axial opening in said second flange, and having at least a second small opening of selected second size in its second end; the improvement comprising:

(c) second valve means in said second small opening adapted to be normally closed and opened responsive to a pressure sensitive means which is itself responsive to the hydrostatic pressure in said liquid at the depth of immersion of said pressure sensitive means; and in which

(d) said pressure sensitive means comprises a second diaphragm, spaced above and coaxial with said first diaphragm; said diaphragm clamped between a third lower flange having at least one opening therethrough and a fourth upper flange having an opening therethrough; the lower side of said second diaphragm, exposed to a variable hydrostatic pressure in said liquid in said receptacle plus atmospheric pressure, and the upper side of second diaphragm exposed to atmospheric pressure plus a contained substantially hydrostatic force;



(e) means to maintain said substantially constant hydrostatic force from the flow of said pressurized liquid when said first valve is open to keep second valve open until said hydrostatic pressure on said upper and lower sides of said second diaphragm is substantially equal.

4,566,485

FREE-FLOATING NEUTRALLY-BUOYANT RECIPROCATING PUMP VALVE FOR ABRASIVE FLUIDS

James L. Ruhle, 2535 E. Balfour Ave., Fullerton, Calif. 92631

Filed Nov. 19, 1984, Ser. No. 673,125
Int. Cl.⁴ F16K *15/02*
U.S. Cl. 137—375 **1 Claim**

1. A free-floating neutrally-buoyant reciprocating-pump valve for abrasive fluids comprising:

a cylindrical valve throat which encloses a free-floating valve,

a neutrally-buoyant valve which responds quickly to pressure-gradient reversals in the fluid conveyed through the valve,

a ballast system which allows the buoyancy of the valve to be adjusted so as to correspond with changes in the density of the fluid conveyed through the valve,

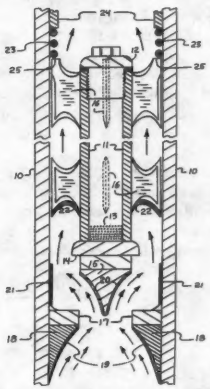
a means to guide the valve consisting of a plurality of radial fins which are affixed to the valve, and centralize and guide the valve through the valve throat and directly into the valve seat,

a valve seat, which is affixed to the valve throat,

a hardfaced fluid deflector which is affixed to the valve throat and the valve seat just upstream from the valve seat,

a hardfaced cone-shaped fluid deflector, which is situated just upstream from a sealing surface of the valve,

a hardfaced region in the valve throat which is situated just downstream from the valve seat,



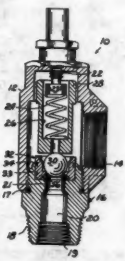
a coil spring and internal shoulder situated inside the valve throat just downstream from the trailing edges of the radial valve fins.

4,566,486

SOFT SEAT FOR SAFETY VALVE

Julian S. Taylor, and Wesley L. Taylor, both of 8300 SW. 8th, Oklahoma City, Okla. 73128

Continuation-in-part of Ser. No. 355,981, Mar. 8, 1982, Pat. No. 4,446,886. This application Mar. 5, 1984, Ser. No. 585,970
Int. Cl.⁴ F16K *17/20*
U.S. Cl. 137—469 **7 Claims**



1. In a relief valve of the poppet-type including a housing having an inlet passageway communicating with an outlet port and having resilient means biasing a valve toward the inlet passageway, the improvement comprising:

a cylindrical seat support having an axial bore therethrough axially disposed in the housing inlet passageway and having a valve huddling chamber in its downstream end portion and a rigid valve seat intermediate its ends facing the valve, the upstream end portion of the seat support having a concentric counterbore defining a cylindrical wall surface on a diameter at least greater than the diameter of the valve housing inlet passageway and terminating in an inwardly and downstream directed frusto-conical surface intersecting the wall forming the axial bore in close spaced relation with respect to the rigid valve seat;

a resilient seal ring having an outer cylindrical surface and a downstream inwardly directed frusto-conical surface

contiguously bonded to the seat support respective upstream counterbored cylindrical and inwardly and downstream directed frusto-conical surfaces, said seal having a first upstream cylindrical inner wall surface diametrically substantially equal with the diameter of the housing inlet passageway and having a second cylindrical inner wall surface spaced downstream from said seal first cylindrical inner wall surface and concentric with and of smaller diameter than the seat support axial bore intersecting downstream the seal outer downstream and inwardly directed frusto-conical surface for forming an annular soft valve seat concentric with said rigid valve seat for sealing with said valve before said valve contacts the rigid valve seat,

the space between said seal first and second cylindrical inner wall surfaces being spanned by an intermediate inwardly and downstream directed frusto-conical surface; and,

means securing said seat support within the valve housing.

4,566,487

CYLINDRICAL PISTON-TYPE SLIDE VALVE FOR PNEUMATIC JIGGING MACHINES

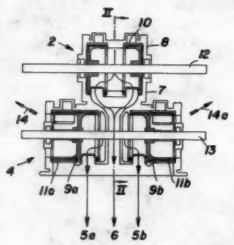
Alexander Lotz, Wetter, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg, Fed. Rep. of Germany

Filed Jan. 8, 1985, Ser. No. 689,651

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400659

Int. Cl.⁴ F16K *11/22*; B03B *5/20*

U.S. Cl. 137—597 **2 Claims**



1. A rotary valve construction, comprising a housing having a first central upper valve housing portion, a central additional stroke air passage extending from one side of said first central upper valve housing portion, a first rotary piston valve controlling the flow through said central additional air stroke passage located in said first central upper valve housing, a first shaft extending through and rotatably supported in said first central upper valve housing and carrying said first rotary piston valve, a double rotary piston slide housing portion below said first central upper valve housing portion and having two housing parts symmetrically arranged with respect to said first central upper valve housing portion and with a stroke air passage on each side of said central additional stroke air passage, said central additional stroke air passage extending through said double rotary piston slide housing portion between said housing portion between said housing parts, a second and third rotary piston valve in respective ones of said housing parts, a second shaft extending through said valve housing parts and rotatably supported therein and carrying said second and third rotary piston valves for controlling the flow through said stroke air passage on each side of said central additional stroke air passage.

4,566,488

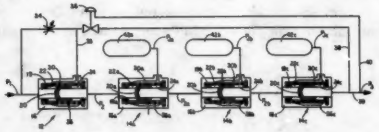
MULTI-STAGE PRESSURE REDUCING SYSTEM

Peter C. M. Chow, Newark, and Walter L. Connolly, Moraga, both of Calif., assignors to Grove Valve and Regulator Company, Oakland, Calif.

Filed Oct. 28, 1980, Ser. No. 201,444

Int. Cl.⁴ G05D *16/16*; F16K *7/02*

U.S. Cl. 137—613 **10 Claims**



1. A multi-stage pressure reducing system comprising:

a main pressure-responsive valve in a pipeline conditioned to open progressively in accordance with the extent to which upstream pressure therein overcomes pressure in a main chamber therein;

a load line connecting a source of line-control pressure fluid to said main chamber;

a bleed line connecting said main chamber to a zone of low pressure

a pilot in said bleed line conditioned to enable bleeding from said main chamber through said bleed line to control the level of pressure in said main chamber so as to maintain a pipeline fluid flow characteristic sensed thereby at a desired level, by reducing pressure in said main chamber through increased bleeding when said sensed characteristic indicates a need for increased flow to a location downstream of said main valve and by increasing pressure in said main chamber through reduced bleeding when said sensed flow characteristic indicates a need for decreased flow to said downstream location;

at least one pipeline fluid flow characteristic sensing conductor to said pilot from a selected location in said pipeline;

an auxiliary pressure responsive valve in said pipeline intermediate said main valve and said downstream location, conditioned to open progressively in accordance with the extent to which inlet pressure therein overcomes pressure in a chamber therein; and

a source of gas at a fixed intermediate pressure lower than pressure in said main chamber and uninfluenced by fluid flow characteristics in said pipeline, connected to said auxiliary valve chamber.

4,566,489

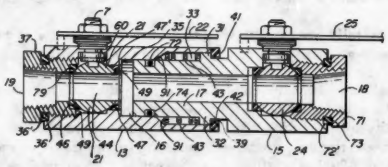
QUICK DISCONNECT COUPLING APPARATUS

Frank W. Knapp, and Caroline M. Knapp, both of Box 289, Mineral Point, Wis. 53565

Filed Mar. 6, 1984, Ser. No. 586,684

Int. Cl.⁴ F16L *37/28*

U.S. Cl. 137—614 **1 Claim**



1. A quick-disconnect high pressure hydraulic coupling assembly for interconnecting first and second hydraulic lines, said coupling assembly comprising:

relatively elongated male and female coupler members each

connectable at one end thereof to a different one of said hydraulic lines and each having a longitudinally extending bore defining a passageway through the associated coupler member, each of said bores being of substantially the same diameter except for a cylindrical enlargement adjacent said one end and said female coupler member having a sleeve portion defined by an increased diameter of its bore at the other end thereof,

said male coupler member having a tip portion defined by a reduced outer diameter at the said other end thereof

said sleeve portion being adapted to receive said tip portion of said male coupler member in telescoping engagement with the passageways of the coupler members in alignment defining a fluid passageway through the coupling apparatus,

locking means for retaining said tip portion within said sleeve portion when the male and female coupler members are coupled together, said locking means including a radially outward extending, partially circumferential projection formed on said tip portion and a retainer channel formed in the inner surface of said sleeve portion for receiving said projection and defining a radially inward extending stop surface at said other end of said female coupler member extending partially around the periphery of said sleeve portion, and spring bias means in said channel for urging said projection into engagement with said stop surface when the coupler members are coupled together,

each of said coupler members including fluid flow control means operable between flow permitting and flow preventing positions to control fluid flow through the associated coupler member,

said flow control means for each coupler member including a valve in its associated enlargement operable to interrupt the flow path through the bore of its coupler member when the valve is operated at its flow preventing position, and to complete the flow path through its coupler member when the valve is operated to its flow permitting position, the valve when in flow permitting position defining an unrestricted fluid passageway through its coupler member,

said valve for each coupler member including a ball and two valve seats spaced longitudinally in its associated enlargement,

each of the balls being mutually operable and including a handle located externally of its associated coupler member and removably coupled to the ball located within the coupler member for moving the ball between a flow permitting position in which its bore is aligned with the port of the valve seat and a flow preventing position in which the ball seals off the port, fitting means at each coupler member one end for connecting said apparatus to a hydraulic line threadably connecting to its associated coupler member and having a flow passage extending therethrough of a size at least as large as said bore, said fitting means having one end adjacent said enlargement whereby said ball is readily introduced into said enlargement after removal of said fitting means, and a circular seal interposed between said tip portion and inner surface of said sleeve portion.

4,566,490

DIRECT SOLENOID OPERATED VALVE WITH MINIMAL TOLERANCE ACCUMULATION

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

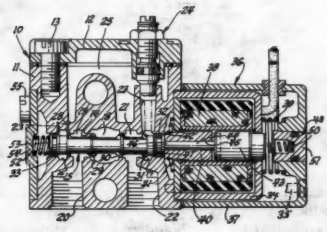
Filed Nov. 12, 1981, Ser. No. 320,506
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **9 Claims**

1. A directional flow control valve including a valve body having a valve spool bore in which is slidably mounted an elongated valve spool provided with a plurality of annular valve members for sliding sealing engagement with a plurality of lands in said valve bore, and wherein said valve spool is shiftable directly by a solenoid in a short stroke, between a first position and a second position, to control the flow of pressurized air through the valve in one direction and the exhaustion of air through the valve in another direction, characterized in that:

(a) the valve includes means engageable with one end of said valve spool for moving said valve spool to said first position;

(b) a solenoid is mounted on said valve body for direct engagement with said valve spool to move it to said second position, and the solenoid includes a pole piece having one end seated against one end of the valve body adjacent one end of said valve bore, and the tolerances for forming the valve spool lengthwise, and the valve bore through the valve body lengthwise, and the length of the solenoid pole piece and push rod are determined from said one end of the valve body;

(c) the solenoid includes means for resiliently biasing said pole piece to the position seated against the valve body;



(d) the other end of said valve spool is seated against said solenoid pole piece when the valve spool is in said first position;

(e) said solenoid includes an armature movable into shifting engagement with said other end of the pole piece when the solenoid is energized; and,

(f) a pusher rod is movably mounted through an axial bore in said solenoid pole piece, and it has one end in operative engagement with said other end of said valve spool and the other end in engagement with said armature, whereby, when said solenoid is energized, said armature moves the pusher rod and the valve spool through a short stroke, from said first position with the annular valve members in sealing engagement with a first set of said lands to said second position with the annular valve members in sealing engagement with another set of said lands, and when said solenoid is de-energized, said means engageable with said one end of said valve spool moves the valve spool back to the first position.

4,566,491

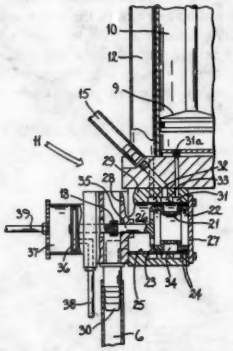
VALVE ESPECIALLY SUITABLE FOR USE IN FILLING MACHINES

Franco Aluola, and Paolo Nipoti, both of Bologna, Italy, assignors to Azionaria Costruzioni Macchine Automatiche - A.C.-M.A. - S.p.A., Bologna, Italy

Filed Jan. 18, 1984, Ser. No. 571,776
Claims priority, application Italy, Jan. 28, 1983, 3323 A/83
Int. Cl.[4] G01F *11/04*
U.S. Cl. 137—625.66 **2 Claims**

1. A slide valve suitable for use in controlling the flow of fluid products in volumetric filling machines, comprising a valve slide which slides inside a first closed cylindrical chamber and has a projection which extends through a sealed passage in one of the ends of the cylindrical chamber, the projection being connected to a double-acting piston controlled by fluid under pressure, the double-acting piston sliding inside a second cylindrical chamber separated and sealed from the first,

said valve slide being spool-shaped and having two opposite end shoulders provided peripherally with means for sealing against the internal walls of said first cylindrical chamber in which the slide is slideable, said shoulder delimiting a part of the slide of reduced section which forms a sealed region for the passage of fluid product, said slide being hollow inside and open at either end so as to be internally in direct communication with the first cylindrical chamber, an inlet to the first cylindrical chamber for a product supplied from a supply source, the inlet being located in a position in which it cannot



be blocked by the slide during its displacements, and outlet for the product to delivery apparatus which opens into the sealed region delimited by the shoulders of the slide, and first and second ports for the product, said slide being movable by said piston between first and second positions, in said first position said inlet being in communication with said first port and said reduced section providing communication between said second port and said outlet, and in said second position, said inlet being in communication with said second port and said reduced section providing communication between said first port and said outlet.

4,566,492

FLUID DISTRIBUTING DEVICE, MORE ESPECIALLY FOR REMOTE CONTROL

Michel Bessard, Saint-Priest, France, assignor to Rexroth Sigma, Venissieux, France

Filed Feb. 13, 1984, Ser. No. 579,585

Claims priority, application France, Feb. 15, 1983, 83 02397

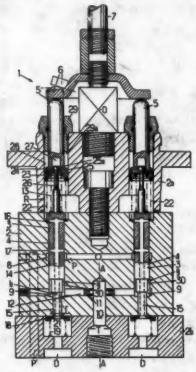
Int. Cl.⁴ F15B *13/04*

U.S. Cl. 137—636.1 **11 Claims**

1. A fluid distributing device for remote control, comprising a body having bores with parallel axes in which are slidably mounted slide valves associated in pairs symmetrically with respect to an axis of the body, these slide valves being controlled by push-rods actuated by an oscillating cam so as to establish desired communications between a pressurized fluid intake, a low pressure fluid reservoir and an outgoing orifice towards a user device, each slide valve bore comprising a groove connected to the pressurized fluid intake, each slide valve being combined with a chamber limited by at least one transverse annular surface of the slide valve and connected to the reservoir by a constriction,

wherein the device comprises return means (R) for each push-rod (5), adapted for maintaining a first push-rod in permanent abutment against the cam (6) when this cam tends to move away from said push-rod during a driving in movement of a second associated push-rod, the slide valve (4) corresponding to the first push-rod being driven by this first push-rod in its movement,

and wherein each slide valve comprises, on its periphery, towards an end (15) remote from the push-rod, a recess (g) whose arrangement and length are such that before an end of a complete movement of the slide valve (4) when this slide valve is driven by the first push-rod, said recess establishes a connection between the pressurized fluid intake (P,8) and said chamber (9), such that there is a



pressure rise of the fluid in this chamber (9) which provides locking of the slide valve (4) and of the first push-rod (5) in a high position and, consequently, locking of the other push-rods and of the corresponding slide valve in a low position.

4,566,493

VALVE ASSEMBLY

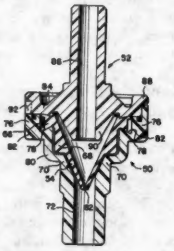
Floyd V. Edwards, Cedarville, and Dennis A. Boehmer, Xenia, both of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Feb. 21, 1985, Ser. No. 703,850

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.⁴ F16K *15/14*

U.S. Cl. 137—846 **7 Claims**



1. Valve assembly for use within a flow path for permitting relatively free flow in said flow path in a first direction and for preventing flow in said path in a second, opposite direction, comprising:

a flow regulator constructed as a single piece from a resilient material, said regulator including a pair of lips, each of said lips having a lip base and an outer end;

said lips being arranged in a converging relationship to define for said regulator an open end adjacent said lip bases, and a normally closed end at said lip outer ends whereat said lips are disposed adjacent each other to define a normaly closed slit therebetween, said regulator further including at least one side wall interconnecting

said lips and an annular flange extending outwardly at said open end;

a housing outlet portion defining a housing interior approximating the shape of said regulator, said housing interior having a pair of planar surfaces corresponding to said pair of lips, each of said planar surfaces having a planar surface base, said surfaces being arranged in a converging relationship from said planar surface bases toward an outlet end, said housing outlet portion further including an outlet port communicating with said outlet end and an annular collar disposed outwardly adjacent said planar surface bases; and

a housing inlet portion having a cover plate and an inlet port communicating therethrough;

said regulator being disposed within said housing outlet portion with said annular flange contained within said annular collar and said lip outer ends extending toward said outlet end of said housing interior, and with said lips being substantially adjacent to but not in contact with said planar surfaces;

said regulator further including a tab formed on at least one of said lips and extending outwardly therefrom near said lip base;

said housing outlet portion further including a recess formed within at least one of said planar surfaces for receiving said tab therein when said regulator is properly positioned within said outlet portion, and further including at least one first notch defined within said collar whereby said notch may be engaged for proper orientation of said outlet portion for receiving said regulator; and

said cover plate being attached to said annular collar for securing said regulator by contact with said flange and for sealing said housing interior.

4,566,494

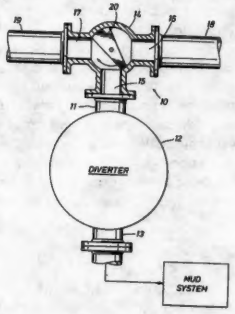
VENT LINE SYSTEM

Joseph R. Roche, Humble, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 458,206, Jan. 17, 1983, abandoned. This application Mar. 1, 1985, Ser. No. 707,521

Int. Cl.⁴ E21B *33/035*

U.S. Cl. 137—872 **8 Claims**



1. A diverting system for directing drilling fluid away from a drilling rig in the event of a kick while drilling a well, the system comprising,

a drilling conduit through which the drilling fluid returns to the drilling rig,

an uninterruptible vent line,

a flow diverter means connected to said drilling conduit and to one end of said vent line for directing drilling fluid to said vent line in the event of a kick in the well,

two uninterruptible deflect lines directed in different directions away from the drilling rig, and

deflecting means connected to one end of each of said two deflect lines and to the other end of said vent line for directing fluid in said vent line to at least one of said two deflect lines while assuring against inadvertent simultaneous closure of said two deflect lines.

4,566,495

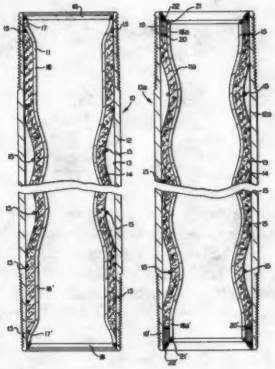
CONCENTRIC WALLED CONDUIT FOR A TUBULAR CONDUIT STRING

John R. Baker; David V. Chenoweth, and David M. McStravick, all of Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Continuation of Ser. No. 264,728, May 18, 1981, abandoned. This application Mar. 8, 1984, Ser. No. 587,560

Int. Cl.⁴ F16L *9/18, 59/14*

U.S. Cl. 138—149 **4 Claims**



1. A concentric walled tubular conduit for forming a tubular string in a subterranean well to transport a fluid between the surface and a subterranean producing formation in an oil well, the temperature of the fluid being greater than the surrounding temperature in the well, comprising: an outer tubular member prestressed in compression; an inner tubular member prestressed in tension, and concentrically received within and spaced from the inner periphery of said outer tubular member; means for respectively rigidly securing the ends of said prestressed inner tubular member to said outer tubular member and for transmitting, between said inner and outer tubular members, forces due to differential thermal expansion and contraction along the entire length thereof, thereby reducing the prestress in both the inner and outer tubular members; and insulating material surrounding said inner tubular member, said inner tubular member having at least one of its ends outwardly flared with each end thereof sealably secured to the adjacent end of said outer tubular member, to define a sealed cavity between said tubular members.

4,566,496

TUBULAR PLASTICS OBJECTS

Stanley W. O. Menzel, San Diego; David E. Mominee, Alpine, and Gilbert W. Vance, Jamul, all of Calif., assignors to J-M Manufacturing Company, Inc., Stockton, Calif.

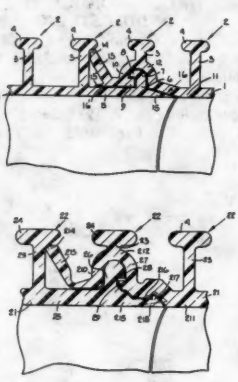
Continuation of Ser. No. 310,693, Oct. 13, 1981, abandoned. This application May 5, 1983, Ser. No. 491,744

Int. Cl.⁴ F16L *9/16*

U.S. Cl. 138—154 **6 Claims**

1. In a tube comprising an elongated strip having a body portion with two longitudinal edges, the strip being spirally wound to overlap and interlock said two longitudinal edges, a first of said longitudinal edges including a locking rib and a second of said longitudinal edges including a longitudinal socket sized to mechanically receive and engage said locking

rib, the improvement comprising one of said longitudinal edges has a sealing flap extending laterally from said generally parallel to said body portion, said sealing flap being resilient relative to said body portion, said sealing flap having a surface for sealing engagement with the other of said longitudinal edges,



said surface having a locking protuberance extending therealong, the other of said longitudinal edges including a mating surface on said body portion in engagement with said surface of said sealing flap, said mating surface comprising a recess which is shaped to conform to said surface of said flap whereby said tube includes a helically extending, fluid-tight seam.

4,566,497

AIR DISCHARGE DEVICE FOR A WEAVING MACHINE

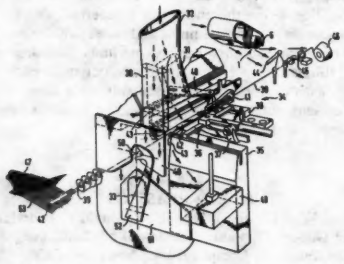
Andreas Schachenmann, Schaffhausen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 27, 1984, Ser. No. 655,211

Claims priority, application European Pat. Off., Oct. 11, 1983, 83110111.8

Int. Cl.[4] D03J *1/04*

U.S. Cl. 139—1 C 10 Claims



1. An air discharge device for a work station in a weaving machine, said device comprising

a housing defining a chamber for receiving a flow of compressed air and having a slot communicating with said chamber to discharge a stream of air therefrom; and

a rotatable body for periodically diverting the stream of air discharged from said slot to create periodic unilateral deflections of the stream of air.

4,566,498

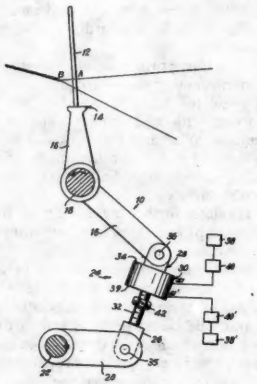
REED CONTROL MECHANISM FOR TERRY LOOM

Gilmer A. Williams, Rte. 5, Box 57, Kannapolis, N.C. 28081, and Douglas Burgess, Rte. 1, Box 278, Woodleaf, N.C. 27054

Continuation of Ser. No. 460,441, Jan. 24, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 652,418

Int. Cl.[4] D03D *39/22*

U.S. Cl. 139—26 8 Claims



1. In a loom for weaving pile-type fabric, an improved reed control mechanism for enabling a reed mounted on a lay beam to perform a multi-pick cycle involving partial beat-up of at least a first pick of weft and full beat up of at least a second pick of weft, said reed control mechanism comprising:

means for imparting reciprocating movement to said lay beam and said reed;

a driving means coupled to said loom; and

a mechanical linkage connecting said driving means to said reciprocating movement imparting means for enabling said driving means to drive said reciprocating movement imparting means, the improvement being characterized in that said mechanical linkage comprises first and second spaced apart elements and a pressure operated control element for maintaining a first spacing between said elements during said first pick of weft and a second spacing between said elements during said second pick of weft, thereby adjusting the terminal point of said reed during reciprocation to enable said partial beat up of at least said first pick and said full beat up of at least said second pick, wherein said pressure operated element is a pneumatic piston-cylinder whose piston-rod is fastened to one of said elements and whose base is fastened to the other of said elements.

4,566,499

JACQUARD MECHANISM

Hiroshi Kitagawa; Masaaki Sato; Mitsumasa Sawai, all of Nagoya; Takeo Yamamoku, Iwakura; Koichi Akatsuka, Tokyo, and Toshio Metoki, Kawasaki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo and Yamada Dobby Co., Ltd., Aichi, both of, Japan

Filed Nov. 23, 1984, Ser. No. 674,166

Claims priority, application Japan, Nov. 24, 1983, 58-221336

Int. Cl.[4] D03C *3/20*

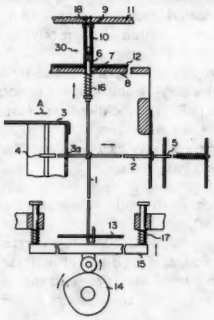
U.S. Cl. 139—59 8 Claims

1. In a jacquard mechanism for controlling a shedding motion or warps set on a loom, comprising a plurality of axially displaceable dropper needles, each associated with a horizontal needle relating to a group of said warps, and a plurality of solenoid, each corresponding to one of said dropper needles, said control being carried out by selectively energizing said

solenoids to hold the corresponding dropper needles by a command from a computer, an improvement comprising,

a printed board on which a circuit for transmission of a command signal from said computer to said solenoids is printed,

solenoids comprising stationary cores, accommodated in housings secured, along with coils, directly on said printed board and disposed at predetermined position along extensions of axes of said dropper needles, and movable cores fixed to ends of said dropper needles closer to said stationary cores;



means for periodically reciprocating all of said dropper needles along each longitudinal axis thereof from a first position where said movable and stationary cores are apart from each other at a predetermined distance to a second position where said movable and stationary cores substantially come into contact with each other;

a guide plate provided with a plurality of holes for stably guiding said movable cores during said reciprocation of said dropper needles; and

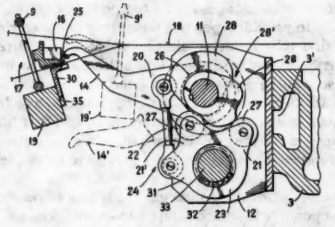
means for urging said dropper needle toward said first position for facilitating the return thereto.

4,566,500

APPARATUS FOR THE CONSTRAINED ACTUATION OF THE CLAMPING SYSTEM OF FILLING-YARN INSERTION DEVICES IN SHUTTLELESS WEAVING MACHINES

Franklin Rodgers, Cham, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Feb. 6, 1985, Ser. No. 698,858
Int. Cl.[4] D03D *47/18*
U.S. Cl. 139—446 **8 Claims**



1. In an apparatus employed in a shuttleless weaving machine wherein filling-yarn is inserted by gripper systems which are bilaterally advanced into the shed and then retracted and which are provided with clamping means for the filling-yarn for constrained actuation of the clamping means by control levers controlled by cam means and entering through the warp threads of the shed from the exterior, the improvement which comprises:

pivot means defining a pivot axis for pivotably mounting said control levers at a fixed location below a path of travel of a fabric being woven in the weaving machine;

a control shaft carrying the pivot means and the control levers and extending beneath said path of travel of said fabric and substantially coincident with said pivot axis;

said cam means comprising at least one mutually complementary cam wheel pair mounted on said control shaft in driven relationship thereto;

actuation means comprising at least one double-lever rocker arm, sensing rolls cooperating therewith for operatively following said cam means, and rocking means defining a rocking axis extending substantially parallel to said control shaft for pivotably mounting said at least one double-lever rocker arm;

said cam means and said actuating means conjointly defining a constrained-control cam system; and

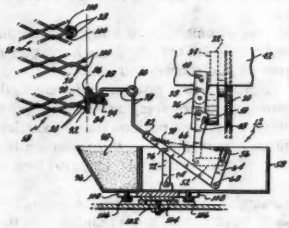
linkage means operatively connecting said control levers with said actuation means for pivoting said control levers out of an operative position entering said shed into an idle position beneath a path of motion of a reed stay of a reed of the weaving machine.

4,566,501

AUTOMATIC END COATING ATTACHMENT FOR A CHAIN LINK WEAVER

Herbert E. Rohrbacher, Whittier, Calif., assignor to Bergandi Manufacturing Co., Inc., South El Monte, Calif.

Continuation of Ser. No. 483,098, Apr. 8, 1983, abandoned. This application May 16, 1985, Ser. No. 734,663
Int. Cl.[4] B21F *21/00*; B05C *1/00*
U.S. Cl. 140—1 **14 Claims**



5. A wire weaver including a coating attachment for dabbing cut ends of chain link formed by the wire weaver with a protective coating, including

coiling means for coiling lengths of wire for weaving into chain link,

weaving means coupled to the coiling means for weaving the lengths of coiled wire together to continuously form the chain link,

cutting means for cutting each length of wire after weaving,

means for mounting the coating attachment at a position adjacent cut ends of chain link after the forming of the chain link by the weaving means,

the coating attachment including,

a receptacle containing a supply of the protective coating,

a dabber member for transferring the protective coating from the receptacle to cut ends of chain link and wherein the dabber member is formed as a plate member,

first means coupled to the dabber member for moving the dabber member between a first position within the receptacle for transferring coating material to the dabber member and a second position in contact with the cut ends for transferring coating material from the dabber member to the cut ends,

the plate member coupled to the first means by a universal

joint to provide for the plate member adjusting in position when in contact with the cut ends, and

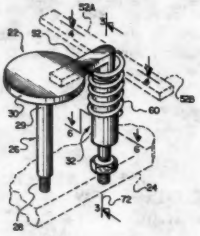
second means coupled to the first means and to a drive mechanism for driving the first means to move the dabber member in synchronism with the forming of the chain link by the wire weaver.

4,566,502

WIRE-GUIDE LATCHING DEVICE FOR A WIRE-HARNESS ASSEMBLY FORM BOARD

James A. Kellogg, Thousand Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jun. 29, 1984, Ser. No. 626,347
Int. Cl.[4] B21F *3/00*
U.S. Cl. 140—92.1 **2 Claims**



1. A wire-guide latching assembly for a wire-harness assembly forming board comprising:

a first post having first and second ends, said first end coupled to the board and said second end terminating in a circumferentially disposed laterally extending flange assembly;

a second post assembly having first and second ends, said first end coupled to the board and having an arm rotatably mounted to said second end, said arm having a free end rotatable from a first position, wherein said free end of said arm is in overlapping relationship with said flange assembly, to a second position free of said flange assembly and, further, moveable to a third position in the opposite direction of said second position, also free of said flange assembly;

a detent assembly mounted within said second post assembly releasably holding said arm in said first or third positions; and

spring means having a first end coupled to said second post, and a second end in contact with said arm for biasing said arm to said first position when said arm is moved toward said second position.

4,566,503

APPARATUS AND METHOD OF SETTING UP APPARATUS FOR SHAPING AND TRIMMING THE LEADS OF INTEGRATED COMPONENTS

Martin G. Heller, 68 Harvey Dr., Short Hills, N.J. 07078; Edward Pecha, Fairlawn, N.J.; Douglas Smith, Pompton Lakes, N.J., and Philip Alcock, Morris Plains, N.J., assignors to Martin G. Heller, Short Hills, N.J.

Filed Dec. 13, 1983, Ser. No. 560,846
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—140 **27 Claims**

1. Apparatus for processing the leads of dual in-line IC components which includes gravitational feeding of said components from a carrier to a processing station, this gravitational feeding along a path disposed at a slope of at least thirty degrees to the horizontal whereat processing of the leads is performed and after which by gravity these now processed components are fed to an accumulation carrier, said apparatus including:

(a) a base plate in operation disposed at a slope of at least thirty degrees and providing above and below areas;

(b) a variable speed motor carried by said base plate and a pair of driven shafts rotatably mounted so as to be substantially normal to said base plate and rotated by drive means also carried by said base plate;

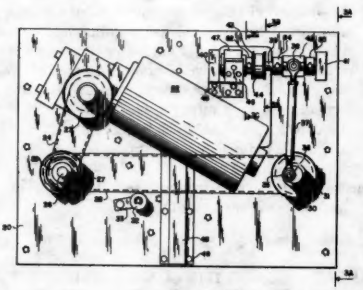
(c) a Pitman arm connected to one of said pair of driven shafts and moved by said drive means and programmed to move a first end in a circular orbital path around an axis of a driven shaft and with the other end of said Pitman arm operably connected to a clutch housing which is moved in a reciprocated manner, said clutch housing operably mounted on a clutch shaft rotatably carried in bearings attached to said base plate;

(d) a one-way clutch carried in and by said clutch housing, this clutch carrying and adapted to rotate said clutch shaft in substantially identical incremental movements and in only a selected direction;

(e) means for rotatably carrying said clutch shaft in a below area of said base plate;

(f) a pivotally mounted feed wheel arm fixedly secured to said clutch shaft and swingably movable around said clutch shaft;

(g) a feed wheel shaft rotatably carried by said pivotally movable arm, said feed wheel shaft disposed in and at the swingable end of the arm, with this shaft carrying a feed wheel on which is a resilient tire attached to the periphery



of said feed wheel, said feed wheel and the attached resilient tire having means to selectively position and secure said feed wheel along said feed wheel shaft;

(h) belt means operatively connected to the clutch shaft and feed wheel shaft and having means for positively rotating said feed wheel in like selected increments, speed and direction so that the resilient tire of the feed wheel when brought into driving engagement with the bodies of the IC components engages only a top portion of the component body to provide a positive advancing and metering means;

(i) a first tube holder which is replaceably and removably carried by the base plate, said holder when secured to the base plate in a position and condition adapted to receive an IC carrier in which the components have like determined center spacing between leads, said first tube holder disposed so that in secured mounted condition like IC components are delivered by gravity to subsequent operations;

(j) a removable infeed slide guide adapted to receive said IC components from a holding carrier and feed said components gravitationally to subsequent operations;

(k) a processing station including die means and means for retaining an IC component in a held-in-place position, said die means including die guide and retaining means removably secured to the above area of the base plate;

(l) a pair of opposed arms each operatively connected to the die means in the processing station and reciprocably moved in said guide and retaining means, each die means

moved by one of said shafts and drive means and in timed relationship to the intermittent rotation of the resilient tire on the feed wheel, each arm and connected die means disposed to move to and from said held-in-position IC component;

(m) a removable lower slide guide adapted to receive the processed IC component, this guide carried by the base plate, and

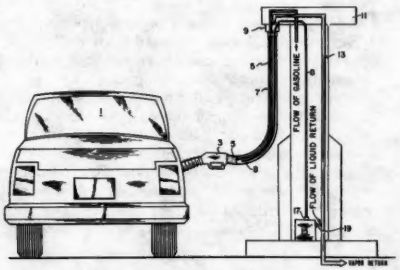
(n) a second tube holder which is removably carried by the base plate, said holder adapted to receive an IC carrier with the processed IC components still retaining their determined lead spacing and length.

4,566,504

INSERTION TUBE LIQUID EVACUATOR SYSTEM FOR VAPOR RECOVERY HOSE

Roger W. Furrow, High Point, and Hal C. Hartsell, Kernersville, both of N.C., assignors to Gilbarco Inc., Greensboro, N.C.

Filed Sep. 15, 1983, Ser. No. 532,290
Int. Cl.[4] B65B *3/18*
U.S. Cl. 141—59 **7 Claims**



1. In a vapor recovery system for a liquid fuel distribution system, apparatus for evacuating liquid fuel from the vapor path of at least one vapor recovery hose coaxial about a fuel product hose, said vapor path being the space between the product and vapor recovery hoses, comprising:

tubing means for providing a pathway for evacuating fuel from said vapor recovery hose, said tubing means being partially inserted within the vapor path between said vapor recovery hose and fuel product hose, one open end of said tubing means being positioned in an area of said vapor path which tends to be a low point where liquid fuel may accumulate during a refueling operation; and

pumping means having at least one inlet port connected to the other end of said tubing means, and an outlet port connected to a fuel storage tank of said fuel distribution system, for sucking liquid fuel from said vapor recovery hose via said tubing means, and delivering this liquid from said outlet port back into said fuel storage tank, thereby keeping said vapor path of said vapor recovery hose substantially free of liquid fuel accumulations tending to block said vapor path.

4,566,505

PACKAGING MACHINE

Walter Ruf, Sandy, and Robert G. Kelley, South Jordan, both of Utah, assignors to St. Regis Corporation, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,766
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—83 **13 Claims**

1. A packaging machine comprising in combination:

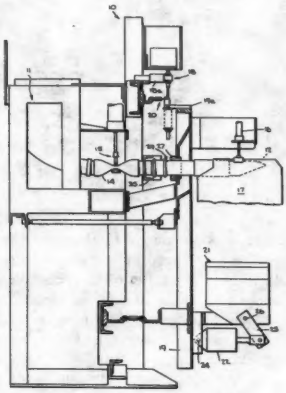
a bin for containing material to be packaged and having material discharge means including a dispensing outlet, conduit means defining a material flow path and a tubular filling spout adapted for introduction into a container to be filled and having a portion adapted to receive said spout;

weighing means for supporting a bag in material receiving position relative to said filling spout;

cut-off means associated with said discharge means and operative when said weighing means records a predetermined gross bag weight to close said discharge means;

adjustable means for isolating forces generated by said cut-off means from said weighing means when said cut-off means are operated to close said discharge means;

an inflatable, tubular sleeve surrounding a portion of said spout and being arranged so that, upon introduction of



said spout into said bag, a portion of said sleeve is also introduced into said bag;

means for introducing fluid under pressure into said sleeve to expand the same and provide a seal between said spout and that portion of the bag surrounding said spout, and to relieve said pressure to deflate said sleeve to permit said spout to be disengaged from the bag; and

reinforcing means at a marginal portion of the upstream end of said sleeve relative to the direction of material flow, thus to prevent that portion of said sleeve from expanding under the influence of pressure introduced into said sleeve.

4,566,506

SYSTEM FOR DISPENSING FLOWABLE FOOD MATERIALS

Clarence W. Cramer, Burlington, and Alfred R. Brewin, III, Moorestown, both of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Oct. 24, 1984, Ser. No. 664,223
Int. Cl.[4] B65B *3/04*; B05C *11/00*
U.S. Cl. 141—160 **7 Claims**

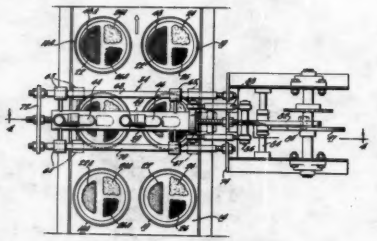
1. In a dispensing system for dispensing a flowable food material from a dispenser onto a predetermined area of a subjacent food container moving on a conveyor beneath said dispenser, said area having non-uniform length dimensions in a direction normal to the direction of motion of said container, the improvement wherein:

said dispenser comprises an adjustable dispensing aperture means and a passageway for receiving said food material and for passing it through said dispenser to said aperture means,

said dispensing aperture means extending substantially directly over the path taken by said area of said container as it is moved by said conveyor, having a maximum length dimension normal to said direction of motion of said con-

tainer which is at least as great as the corresponding maximum dimension of said area, and having a width dimension along said direction of motion which is small compared with the corresponding width dimension of said container area;

movable closure means for said aperture means, controllably movable with respect to said aperture means along a direction transverse to the direction of motion of said food container to vary the length of the portion of said aperture means which is open at any time; and



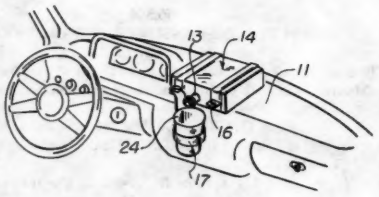
control means responsive to changes in the position of said container with respect to said dispenser for controlling said transverse motion of said movable closure means to change said length of said open portion of said aperture means as a function of said position of said container, so that said material is dispensed through said aperture means over substantially the entirety of said area of said container, but not substantially outside of said area, as said container passes beneath said dispenser.

4,566,507

LIQUID BEVERAGE DISPENSER

George P. Rauchwerger, 147 Cromart Ct., Sunnyvale, Calif. 94087

Filed Feb. 9, 1984, Ser. No. 578,494
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—271 4 Claims



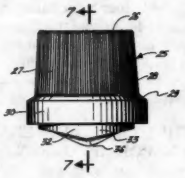
1. In combination, a vehicle dashboard ledge, a top thermal insulating container portion having a bottom surface, a bottom thermal insulating portion having a top surface shaped to fit tightly against said top surface, said portions being internally recessed to form a chamber, a flexible bag within said chamber having a dispenser spout at one end, at least one said portion being formed with a notch through which said spout extends, at least one strap around said portions to detachably secure said portions together, a lug on said strap in proximity to said spout, a cup holder, means pivotally mounting said cup holder on said lug, and attachment means securing said strap to said ledge.

4,566,508

SELF-DRAINING CLOSURE

Edward E. Bowyer, North Vernon, Ind., assignor to Ethyl Molded Products Company, Richmond, Va.

Filed Dec. 17, 1984, Ser. No. 682,088
Int. Cl.[4] B65D *51/24*
U.S. Cl. 141—381 2 Claims



1. A closure for a container having a cylindrical neck portion comprising:

(a) a circular top wall portion;

(b) an integral upper sidewall portion depending from said top wall portion and extending above said container neck portion;

(c) an integral lower sidewall portion depending from the lower end of said upper sidewall portion;

(d) mean for coupling said lower sidewall portion to the outside of said neck of said container;

(e) an integral annular collar member depending from said lower end of said upper sidewall portion and extending into the inside of said cylindrical neck portion and spaced away from said inside of said neck portion;

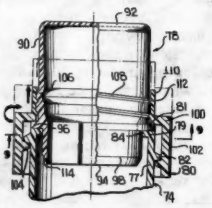
(f) a generally triangular shaped pour lip extension integral with the lower end of said annular collar member and which has a reduced thickness compared thereto.

4,566,509

CLOSURE UNIT INCLUDING MEASURING CUP

John L. Szajna, Norridge, Ill., assignor to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Jul. 9, 1984, Ser. No. 628,940
Int. Cl.[4] B65D *45/30*
U.S. Cl. 141—381 7 Claims



1. A closure unit comprising a measuring cup and a ring member, said measuring cup including a generally cylindrical body having an open end and a bottom, said body being of an external diameter to be received in a neck of a container to be closed by said closure unit, a combined positioning and sealing flange carried by the exterior of said body in sealed relation to said body for engaging in sealed relation a sealing lip of a container to be closed, said flange being disposed adjacent to but positively spaced from said body open end, said ring member including an annular flange and a depending skirt, said annular flange defining an opening receiving said mesuring cup with said annular flange overlying said measuring cup flange for clamping said measuring cup flange against a container sealing lip, and retaining means on said skirt for interlocking engagement with a container neck finish, said body having a

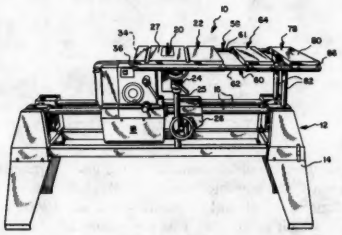
sliding close fit within said ring member opening, said body open end being recessed within said skirt when said annular flange is engaged with said measuring cup flange, and said ring member being slidable on said body to a position wherein said body open end projects axially beyond said skirt whereby said ring member in no way interferes with the pouring of a product from said measuring cup.

4,566,510

WORKPIECE SUPPORT SYSTEM FOR A POWER TOOL

Robert L. Bartlett, Dayton; Charles J. Haas, Middletown, and John G. Legler, Huber Heights, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Filed Nov. 16, 1983, Ser. No. 552,596
Int. Cl.⁴ B27C 9/02
U.S. Cl. 144—1 C **7 Claims**



6. For use with a multipurpose power tool of the type having a frame, a headstock mounted on the frame, and a power-driven tool member attached to an output shaft of the headstock, a workpiece support system comprising:

a main table adapted to be mounted on a frame;

first rail means attached to opposing longitudinal sides of said main table and having a continuous, hollow interior;

rod means telescoping within said interiors of said first rail means;

an auxiliary table having second rail means attached to longitudinal sides thereof and having a continuous, hollow interior receiving said rod means therein and sized such that said auxiliary table is slidable relative to said main table;

said first and second rail means including first and second pairs of tubular rails, respectively; and rod means including a pair of tubular rods;

locking means including a plurality of capstan screws having shanks displaceably attached to said main and said auxiliary tables and opposite ends extending through adjacent ones of said rails, means for displacing said screws sidewardly and outwardly from said table, said displacing means including a plurality of capstan portions, each attached to one of said screws such that said extensions may be locked against said associated rails to prevent relative movement between said tables and said extensions, or displacing said screws inwardly, thereby releasing said extensions from locking engagement;

said tables including means threadedly engaging said shafts;

a secondary table adapted to be mounted on a frame supporting said main table and having a third pair of rails with continuous, hollow interiors, said rails receiving ends of said rods such that said auxiliary table is supported between said main table and said secondary table;

a second secondary table having a fourth pair of rails; one of said rods being sized to extend through said rails of said secondary tables such that ends thereof protrude outwardly from said rails; and

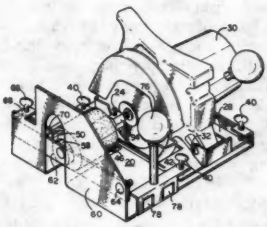
a pair of end sections attached to and extending sidewardly from said ends, a side section attached to and extending between said end sections, and leg means for supporting said end and side sections.

4,566,511

SANDER ATTACHMENT FOR ROTARY POWER SAW

James L. Robinson, 4706 Hazel Ave., Philadelphia, Pa. 19143

Filed May 11, 1984, Ser. No. 609,497
Int. Cl.⁴ B27C 9/02
U.S. Cl. 144—1 F **16 Claims**



1. An apparatus for attachment to a portable rotary saw of the type having a housing with a motor and means for removably attaching a saw blade to a motor shaft thereof, the saw drive unit also having a platform and means for positioning the motor shaft relative to the platform, the apparatus comprising:

a support plate having clamping means to engage the platform;

an adjustment arm attached to the support plate and movable toward and away from the support plate; and,

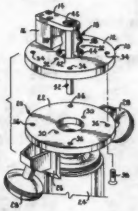
a working wheel mounted on a shaft rotatably fixed to the adjustment arm and engageable at one end to the means for attaching the saw blade, in place of said saw blade.

4,566,512

ROUTER ATTACHMENT

Basil L. R. Wilson, 2860 Porter, Wichita, Kans. 67204

Filed Mar. 11, 1985, Ser. No. 710,029
Int. Cl.⁴ B25F 5/00
U.S. Cl. 144—134 D **8 Claims**



8. An attachment for a router having a relatively large diameter, circular sole plate provided with positioning holes therein, an electric motor secured to the sole plate and means for releasably coupling a cutting bit to the motor shaft, said attachment comprising:

a circular disc having a pair of parallel, flat surfaces, one of said surfaces being adapted to fit against said router sole plate in close fitting abutting relationship thereagainst, said disc being provided with a central circular aperture extending therethrough, said aperture having a first portion of reduced diameter communicating with the router abutting flat surface, and a second portion of greater diameter than said first portion and concentric therewith communicating with said first portion and with the opposite face of said disc;

a plurality of positioning studs carried by said disc and projecting from said router abutting flat surface, there being a stud for each sole plate hole respectively, the respective

studs being aligned with corresponding alignment holes for holding the disc in concentric alignment with said router sole plate;

means for releasably securing the disc in said close fitting, concentrically aligned abutting relationship against the router sole plate;

an elongated, rigid end element having a circular opening adjacent one end thereof extending through the member;

a massive block of rigid material having a pair of parallel, opposite ends and a width dimension less than the radial distance between the periphery of said aperture second portion and the outer periphery of the disc;

means rigidly securing the block between the disc and the element with one end of the element disposed in flat, abutting relationship against said disc opposite surface and extending between the aperture second portion and the outer periphery of the disc;

means rigidly securing the element to the other end of the block in disposition extending parallel with said disc opposite surface and cantilevered from the block with the element opening disposed in spaced apart, axial alignment with the disc aperture;

bearing means positioned in the element opening; and

an elongated rotatable cutting tool, said tool having an elongated shaft having one end mounted for rotation in said bearing means, the other end of the bit shaft extending through the disc aperture and adapted to be coupled by said coupling means with the shaft of said router for rotation thereby, and a plurality of elongated blades rigidly secured to the bit shaft and projecting radially therefrom, each blade having an outer cutting edge configured to provide an ornamental configuration to an object to be shaped with the attachment, each blade cutting edge partially extending into said second aperture portion of the disc to eliminate the possibility for ridges in the object between the plate and the blade cutting edge.

4,566,513

ARRANGEMENTS IN BARKING MACHINES

Erik Sundberg, Hofors, Sweden, assignor to Weller Innovation AB, Hofors, Sweden

Filed Aug. 13, 1984, Ser. No. 639,790

Claims priority, application Sweden, Mar. 2, 1984, 84-01178

Int. Cl.⁴ B27L *1/00*

U.S. Cl. 144—208 E **8 Claims**

1. In an improved log barking machine for scraping bark from logs of various sizes and shapes, said machine having a frame, an annular rotor adapted to receive a log therethrough, means mounted on said frame and supporting said rotor for rotation, a plurality of barking tools each carried by an arm, each arm is pivotally mounted on the rotor for generally radial movement, the improvement comprising a gas spring cylinder for each arm biasing the barking tool into contact with the log, said gas spring cylinder having a self-contained supply of pressurized gas, a double acting differential piston and rod located in the cylinder, and a gas passage extending through the cylinder to equalize pressure on opposite sides of the piston to maintain a constant bias on the arm.

4,566,514

PNEUMATIC VEHICLE TIRE

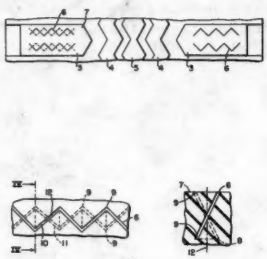
Gerhard Maiik, Wunstorf, and Heinrich Huinink, Garbsen, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,349

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324649

Int. Cl.⁴ B60C *11/12*

U.S. Cl. 152—209 R **11 Claims**



1. A pneumatic vehicle tire which includes a tread in which are disposed fine slits which are inclined relative to the circumferential direction of said tire, and which are twisted about a twist axis which extends at least approximately radially.

4,566,515

WHEEL AND SOLID TIRE ASSEMBLY HAVING LOCKING RING

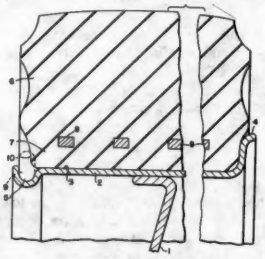
Heinz Kühn, Waldeck, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 693,008

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402811

Int. Cl.⁴ B60C *7/24*

U.S. Cl. 152—402 **5 Claims**



1. A wheel and tire assembly for a vehicle, including a solid tire of rubber or rubber-like synthetic material, and a wheel body which has a rim with at least one edge thereof as well as a seating surface on which said tire can be mounted as well as optionally including a retaining ring therewith if necessary; said at least one edge of said rim being provided with a circumferential groove for selectively and subsequently receiving said retaining ring if necessary in a region over said circumferential groove for holding said tire; said tire being adapted to be mounted on said rim with such a tension that said solid tire can be secured on the latter via diameter prestressing of the material of the tire itself without said retaining ring;

the improvement therewith wherein said solid tire has a base with a predetermined diameter which is adapted to be

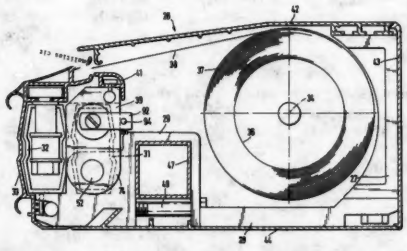
seated on said rim seating surface, and which has a width of such a dimension that when said retaining ring is omitted, said tire base itself under tension exerted as to tire diameter extends slightly into the region located over said circumferential groove, which would otherwise be occupied by said retaining ring so that said solid tire is held by the width thereof under tension along with diameter prestressing securely positioned on said rim seating surface and securely positioned relative to said circumferential groove.

4,566,516

JOINTED ARM MECHANISM FOR AN AWNING

Viktor Lohausen, Goldmühlestrasse 99/2, D-7032 Sindelfingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 469,728, Feb. 25, 1983, abandoned. This application Nov. 21, 1984, Ser. No. 673,913
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3206963
Int. Cl.[4] E04F *10/06*
U.S. Cl. 160—22 **14 Claims**



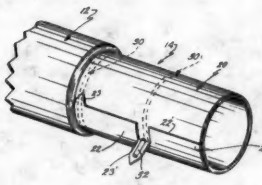
1. In a joint arm mechanism for an awning
support means defining
a horizontal tilting axis, and
a horizontal swivel axis;
shaft means for receiving a coil of the awning, said shaft means extending parallel to said tilting axis and being supported by said support means;
bearing block means tiltable from an initial position, in which said awning is fully coiled onto said shaft means, about said horizontal tilting axis, said bearing block means including
joint means defining a pivot axis extending substantially normally to said tilting axis, and
abutment means for limiting the tilting movement which comprises a recessed body;
joint arm means pivoted by said joint means and comprising
a first joint arm section having two ends and being connected to said joint means with one of these ends,
an intermediate joint at the free other end of said first arm section, and
a second joint arm section connected to said intermediate joint;
tilting limiter means for limiting the tilting movement of the bearing block means about said tilting axis, said tilting movement from said initial position of said bearing block means occurring when said awning is uncoiled, said tilting limiter means including
screw means defining a longitudinal axis and being rotatably about said longitudinal axis and swingably supported on said swivel axis, but substantially undisplaceable in axial direction,
actuating means to rotate said screw means through one of their ends which is averted from said bearing block means, and
counter-abutment means on said screw means for engaging said abutment means, said counter-abutment means including a body of rotation generated about said longitudinal axis and being located within the range of the other end of said screw means that faces said bearing block means, said body of rotation having a periphery which fits into the recessed body of said abutment means;
in the initial position, said abutment means and counter-abutment means being out of engagement and said counter-abutment means being directed towards said abutment means.

4,566,517

WINDOW SHADE ROLLER WITH MANUAL SEVERING MEANS

Terry L. Simon, Goshen, Ind., assignor to The Breneman Company, Norcross, Ga.

Filed Mar. 28, 1983, Ser. No. 479,838
Int. Cl.[4] E06B *9/20*
U.S. Cl. 160—263 **11 Claims**



1. A tubular roller for window shades, comprising: an elongated cylindrically-shaped roller member; means at each end of said roller member for suspending it between a pair of spaced mounts; said roller member having an integrated and unitary internal structure which provides sufficient beam strength to support both said roller member and an elongated sheet of window shade material coiled around the roller member without substantially bowing or drooping; said integrated and unitary internal structure consisting of on the order of about six wraps of sheet material wound upon themselves and adhesively secured together to substantially prevent relative slippage between the adjacent surfaces of successive wraps, said sheet material forming said adhered wraps having the structural characteristics of 90-to-120 pound test Stress Kraft including non-directional tearability and a sheet thickness on the order of about 0.010 inch, said adhered wraps constituting integrated laminar supports which together provide substantially all of the beam strength of said roller required to substantially prevent bowing or drooping medially of the roller when the latter has a window shade wound thereupon and is suspended from its opposite ends.

4,566,518

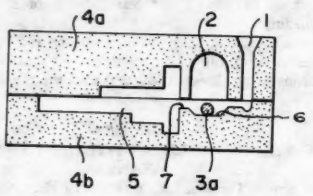
METHOD OF HEAT RETENTION IN A BLIND RISER

Jun Kawamura, Nikko, and Sakuzo Fukano, Tokyo, both of Japan, assignors to Aikoh Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,048
Int. Cl.[4] B22D *27/04*
U.S. Cl. 164—53 **4 Claims**

1. The method of heat retention in a blind riser in a metal casting method by using a cope and drag sand mould having a blind riser and a mould cavity, comprising the steps of:
loosely placing a briquette-like exothermic moulded composition in the drag below the blind riser in the cope;
said exothermic moulded composition having a bulk specific gravity less than that of the molten metal of the casting method; creating a holding cavity in the drag below the blind riser in the cope;
said exothermic moulded composition being of a size larger than a gate between the holding cavity and the mould cavity to preclude escape of the exothermic moulded composition from the blind riser; and

thereafter introducing molten metal into the mould cavity to contact the exothermic moulded composition and cause it to float up into the blind riser to generate an exothermic



reaction, thereby increasing the heat retention of the melt in the blind riser and the feeding effect of the melt into the mould cavity.

4,566,519

METHOD OF MAKING A CONNECTING ROD

Keisuke Ban, and Yasuo Ohashi, both of Fujimi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,360
Claims priority, application Japan, Dec. 2, 1981, 56-194134
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.⁴ B22D *18/02, 19/14*
U.S. Cl. 164—97 **5 Claims**

1. A method of making a connecting rod for an internal combustion engine, the rod having a smaller annular end portion, a larger end portion, and a rod portion therebetween, the rod portion having a longitudinal axis, the method comprising the steps of:

shaping a bundle of inorganic reinforcing fibers; placing the bundle in a mold, the mold having cavities to form the annular end portions and a rod portion having a circular cross-section, the bundle being placed along the longitudinal axis of the rod portion cavity, the mold being sized such that there is a predetermined near uniform annular gap between the bundle and the cavity wall for the rod portion; squeeze casting a molten light metal alloy into the mold, forming a matrix annular layer of the alloy around the bundle in said gap; machining the matrix annular layer to a predetermined shape thereby removing a predetermined machining allowance from the rod portion.

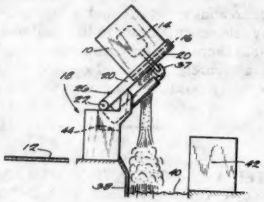
4,566,520

METHOD AND APPARATUS FOR REMOVING A CASTING FROM A SANDBOX

Robert C. Shebuski, Hubertus, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 15, 1984, Ser. No. 621,204
Int. Cl.⁴ B22D *29/00*
U.S. Cl. 164—131 **9 Claims**

1. A method for removing a casting from a sandbox, the method comprising the steps of rotating a sandbox including therein a casting embedded in sand so as to dump the sand from the sandbox, holding the casting while the sand is being dumped so as to maintain a substantially stationary relationship



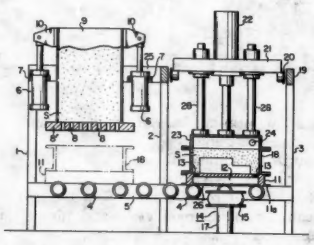
between the casting and the sandbox, and removing the casting from the sandbox after a portion of the sand has been dumped.

4,566,521

MOULDING APPARATUS FOR MAKING GAS HARDENED SAND MOULD

Nagato Uzaki, Toyohashi; Toshihisa Komori, Toyokawa; Kazuharu Matui, Toyokawa, and Shigehiro Toyoda, Toyokawa, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Sep. 17, 1982, Ser. No. 419,306
Claims priority, application Japan, Sep. 28, 1981, 56-154542
Int. Cl.⁴ B22C *9/12, 15/22*
U.S. Cl. 164—160.1 **1 Claim**



1. A moulding apparatus for making gas hardened sand moulds comprising:

a pattern plate having an upper wall on which a pattern is placeable and having a plurality of vent holes therein, a bottom wall, a peripheral side wall and at least one flange, said upper wall, side wall and bottom wall defining a hollow chamber having means connectible to a source of vacuum,

a hollow flask having an open upper end, an open lower end, and a peripheral side wall, said flask being releasably laid on the upper wall of said pattern plate and, when laid thereon, forming an enclosure with a closed side wall periphery around a pattern placed on said pattern plate with the upper end of said enclosure open,

conveyor means for reciprocally and horizontally moving said pattern plate with said flask so laid thereon between a first position for filling moulding sand into said flask surrounding a pattern on said pattern plate and a second position for hardening the filled moulding sand,

means for clamping said pattern plate in said second position for preventing upward movement of said pattern plate, said means for clamping comprising a stopper disposed above said pattern plate flange and at least a pneumatic spring for urging said pattern plate upward such that the upper face of said pattern plate flange forcibly engages said stopper,

hopper means for providing moulding sand disposed above said flask at said first position and having a top open to the atmosphere and a bottom plate with a surface large enough to close said upper open end of said flask, said bottom plate having a plurality of through holes for discharging moulding sand contained in said hopper means into said hollow flask through said flask end and fill said flask without pressure above atmospheric pressure being applied to said hopper means and said sand therein,

means for reciprocally and vertically moving said hopper means relative to said flask,

a rigid cover member disposed above said flask at said second position and being releasably and sealably layable upon said open upper end of said flask, said cover member having an open bottom, a closed top and defining with said flask when sealably laid thereon a chamber for receiving hardening gas, and means on said cover member connectible to a source of hardening gas, and

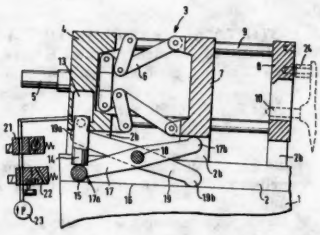
means for reciprocally and vertically moving said cover member relative to said flask for sealably laying said open bottom of said cover member over said upper open end of said flask;

whereby, when said pattern plate with said flask so laid thereon are in said first position, moulding sand can be filled from said hopper means and drawn into said flask solely by vacuum by lowering the hopper means onto the flask and applying a vacuum to said hollow chamber to pull the sand down into and fill the flask and compact the sand without application of additional pressure to the sand and, when said pattern plate with said flask so laid thereon and with said sand therein are in said second position, the hardening gas can penetrate the moulding sand solely by vacuum by lowering the cover member to seal said open upper end of said flask and applying a vacuum to said hollow chamber to draw hardening gas down through the sand.

4,566,522
HOT CHAMBER DIE CASTING MACHINE

Roland Fink, Winterbach, and Walter Klingenstein, Urbach-Nord, both of Fed. Rep. of Germany, assignors to Oskar Frech GmbH and Co., Fed. Rep. of Germany

Continuation of Ser. No. 263,063, May 13, 1981, abandoned.
This application Nov. 28, 1983, Ser. No. 555,446
Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018288
Int. Cl.⁴ B22D *17/04, 17/26*
U.S. Cl. 164—316 **21 Claims**



1. A hot chamber die casting machine for processing molten metals, the machine comprising

machine frame means, and a mold closing means mounted on the machine frame means and having a crosshead,

a control piston means slidable with respect to the crosshead,

a mold mounting table means displaceable with respect to said machine frame means,

a scissors-type linkage means arranged below the closing means for adjusting a position of the mold closing means relative to the machine frame means,

the scissors-type linkage means comprising at least a pair of levers, each of which is a two armed lever,

means for pivotally connecting the levers to each other arranged in a center area of each of the levers,

one arm of a first of the levers mounted at the crosshead with the second arm of the first lever resting on a guide surface means of the machine frame means,

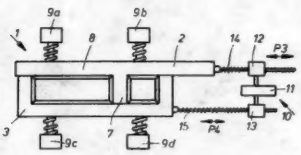
one arm of a second of the levers being arranged so as to be acted upon by said control piston means, with the second arm of said second lever resting against a bottom surface of said displaceable mold mounting table, and

drive means for spreading the scissors-type linkage means so as to enable an adjustment of the mold closing means.

4,566,523
ADJUSTABLE SLIDING MOLD FOR MULTIPLE-STRAND CASTING DEVICES

Gert Vaubel, Warburg, Fed. Rep. of Germany, assignor to Benteler-Werke AG Werk Neuhaus, Paderborn, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,761
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224065
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.⁴ B22D *11/00*
U.S. Cl. 164—420 **8 Claims**



1. An adjustable sliding mold for use in continuous casting installations, comprising two angular mold parts slidably engaging each other at two contact surfaces to form an adjustable extrusion channel of a substantially rectangular cross section; one of said two mold parts being formed with at least one arm projecting into said extrusion channel and slidably engaging the opposite mold part at an additional contact surface to subdivide the extrusion channel into a plurality of parallel extrusion passages.

4,566,524
METHOD OF AND APPARATUS FOR CASTING A COMPOUND METAL BAR

E. Henry Chia, and Ronald D. Adams, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 2, 1982, Ser. No. 446,128
Int. Cl.⁴ B22D *11/00, 19/08*
U.S. Cl. 164—461 **4 Claims**

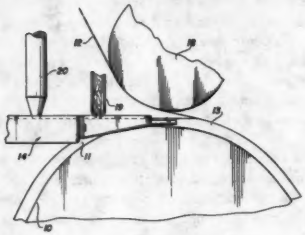
1. A method of continuously casting a compound metal bar having a core metal encased in a clad metal comprising the steps of:

continuously advancing a metal casting mold;

continuously substantially horizontally pouring a first molten metal into said mold from an opening in a side wall of a tundish;

continuously substantially horizontally discharging a second

molten metal into the mold at a point submerged beneath the surface level of the first molten metal; and



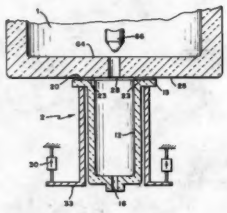
continuously solidifying said first and second metals to form said compound metal bar with substantially no oxidation at the interface between two molten metals.

4,566,525

NOZZLE ASSEMBLY

Hsin L. Li, Parsippany; Thomas K. Morris, Cedar Knolls; David B. Seal, North Caldwell, and Edward V. Limoncelli, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 491,471, May 4, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,791
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—463 **12 Claims**



1. An apparatus for casting continuous metal strip comprising:

(a) nozzle means for extruding molten metal, which has a nozzle body, a nozzle inlet opening, a nozzle exit orifice and a substantially planar nozzle mounting surface located on a nozzle flange proximate to said nozzle inlet;

(b) reservoir means in fluid communication with said nozzle means for containing said molten metal, said reservoir means having a reservoir outlet opening for flowing said molten metal therethrough and having a substantially planar reservoir mounting surface located proximate to said reservoir outlet which is adpated to mate with said nozzle mounting surface and allow a relative, sliding-type movement therebetween due to a differing thermal expansion of said nozzle means relative to said reservoir means;

(c) resilient, heat resistant sealing means located between said nozzle mounting surface and said reservoir mounting surface for minimizing molten metal leakage therebetween;

(d) heater means disposed about said nozzle for heating molten metal contained therein; and

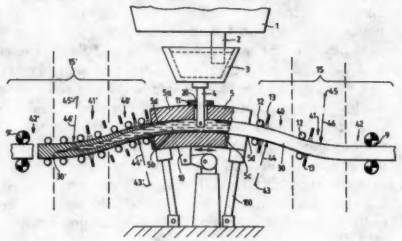
(e) force means for moving said heater means into contact with said nozzle flange and resiliently urging said nozzle mounting surface toward said reservoir mounting surface to mate said nozzle and reservoir means together.

4,566,526

METHOD AND APPARATUS FOR SEMI-HORIZONTAL CONTINUOUS CASTING

Herbert Fastert, Wyckoff, N.J., and Carl Langner, Monsey, N.Y., assignors to Concast, Incorporated, Montvale, N.J.

Filed Sep. 27, 1982, Ser. No. 425,119
Int. Cl.[4] B22D *11/04*
U.S. Cl. 164—478 **18 Claims**



1. A method of continuously casting metal strands, especially steel strands, comprising the steps of:

introducing molten metal to be cast into an essentially horizontally extending, metallic continuous casting mold through a mold inlet opening at an upper wall of the metallic mold, said metal being introduced in a direction substantially normal to the longitudinal axes of the cast strands;

withdrawing two partially solidified strands from opposite lateral outlet openings of the continuous casting mold;

guiding each of the withdrawn cast strands along two strand guide tracks curved in opposite direction to a level which is lower than the level of the continuous casting mold;

cooling the thus withdrawn cast strands;

thereafter straightening the withdrawn cast strands;

employing as the continuous casting mold a curved continuous casting mold having a predetermined center of curvature; and

said step of guiding each of the withdrawn cast strands includes guiding at least one of the withdrawn cast strands along its strand guide track such that at least a portion of said at least one withdrawn cast strand is curved so as to possess a predetermined center of curvature which is located on an opposite side of said withdrawn cast strand than the location of said predetermined center of curvature of said curved continuous casting mold.

4,566,527

ISOTHERMAL HEAT PIPE SYSTEM

Kynric M. Pell, R.F.D. 2, Soldier Springs Rd., and John E. Nydahl, 1666 Diamond Head Ct., both of Laramie, Wyo. 82070

Filed Sep. 15, 1980, Ser. No. 186,913
Int. Cl.[4] F28D *13/00*
U.S. Cl. 165—1 **10 Claims**

1. Apparatus for transferring heat from a primary heated fuild isothermally to divers portions of a different medium to be heated, comprising:

container means for containing a volatile liquid in an enclosed chamber;

a volatile liquid in said container means and only partially filling said container means such that a portion of the interior of said container means extends above the surface of said volatile liquid;

distribution means for distributing vapor of said volatile liquid to divers portions of said medium to be heated, said distribution means including a plurality elongated extensions of said container means connected in fluid-flow relation to and extending outwardly from said portion of said container means above the surface level of said vola-

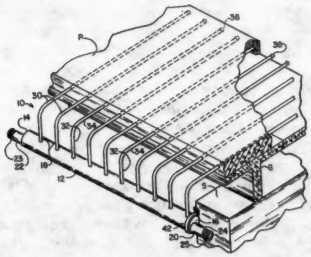
tile liquid in said container means into divers portions of said medium to be heated in spaced-apart relation to each other in such a manner that there is a continuous downward gradient in each of said extensions from the distal end thereof to said container means; and

heat exchanger means in said container means for transferring heat from the primary heated fluid to the volatile liquid in said container means.

10. The method of transferring heat from a primary heated fluid isothermally to divers portions of a pavement slab to be heated, comprising the steps of:

positioning a container for containing a volatile liquid in an enclosed chamber adjacent to and lower than the pavement to be heated;

placing a volatile liquid in the enclosed chamber of said container in such a manner as to only partially fill said chamber leaving a portion at the top of said chamber unfilled;



positioning a plurality of elongated extensions of said container that are in fluid-flow communication with said portion of said chamber above the surface level of said volatile liquid in dispersed, spaced-apart relation in said pavement to be heated with a continuous downward gradient in each of said extensions from the distal end thereof to said chamber;

circulating said heated primary fluid through a hollow conduit positioned inside said enclosed chamber in close physical contact with said volatile liquid to effect a heat transfer but not a fluid transfer from said primary fluid through said hollow conduit to said volatile fluid sufficient to cause at least a portion of said volatile liquid in said chamber to vaporize; and

allowing the vapor to migrate from any portion of said container into any of said extensions as determined by the differential pressure gradients therein.

4,566,528

REGULATOR CIRCUIT FOR VEHICLE AIR CONDITIONER

Theodor Helmle, Ellwangen, and Kurt Weber, Stuttgart, both of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co KG, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 606,577

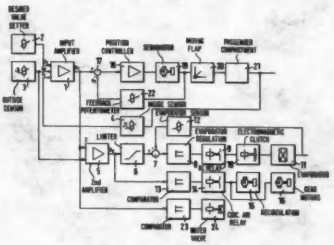
Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316060

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—26 **14 Claims**

1. A regulator circuit for controlling the cooling and heating system of an automotive vehicle comprising:

a first amplifier having an output signal connected to a means for regulating the heating of the vehicle, means for supplying the first amplifier with a signal proportional to the external temperature, means for supplying the first amplifier with a signal proportional to the internal temperature of the vehicle, and means for supplying the first amplifier with a signal proportional to the desired temperature for the vehicle, a second amplifier having an output signal connected to a means for regulating the cooling of the vehicle, means for supplying an input of the second



amplifier with the output signal of the first amplifier, and means for supplying the input of the second amplifier with a signal proportional to the external temperature of the vehicle.

4,566,529

COOLING DEVICE, IN WHICH CONVERTERS OR RECTIFIERS OR OTHER SEMICONDUCTOR COMPONENTS ARE IMMERSED IN BOILING LIQUOR

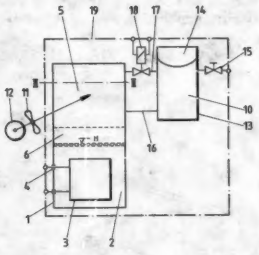
Erwin Klein, Heddesheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,354

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236612

Int. Cl.[4] H05K *7/20*

U.S. Cl. 165—32 **5 Claims**

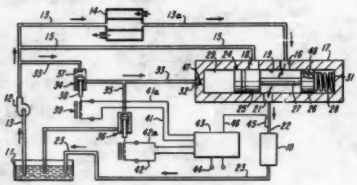


1. Cooling device for semiconductor components, comprising a chamber for receiving semiconductor components, boiling liquid disposed in said chamber for immersing the semiconductor components, means connected to said chamber for supplying a cooling air to eliminate a temperature rise of said boiling liquid and to remove a maximum power loss at a normal maximum ambient temperature, a thermal energy accumulator connected to said chamber, and means for switching off said cooling air supply means and means for switching on said thermal energy accumulator if the ambient temperature of the cooling air rises.

4,566,530
PRESSURE OPERATED SHUTTLE VALVE

Richmond A. Gooden, Kettering, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed May 11, 1983, Ser. No. 493,568
Int. Cl.[4] F28F 27/02
U.S. Cl. 165—36 5 Claims

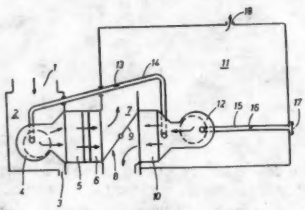


1. In a fluid circulating system including fluid conducting lines a pump, a reservoir, a heat producing component, a heat exchanger and a valve body, said pump circulating fluid through said fluid conducting lines from the reservoir through the heat exchanger and the valve body and the heat producing component and back to the reservoir respectively and the system providing another parallel fluid conducting line leading in by-passing relation to said heat exchanger, said valve body having a plurality of fluid inlets receiving fluid respectively from said fluid conducting lines and said another parallel line and a common fluid outlet, a spool type valve slidable longitudinally in said body and variably positionable therein to control the flow of fluid from said inlets to said outlet, said valve at its one end defining with an end of said body an interior pressure chamber, the pressure in which is applied in a direction to urge said spool valve in one direction, means for diverting a portion of the circulated fluid to said pressure chamber, resilient means urging said spool valve in the opposite direction, and means responding to a changing temperature of the fluid exiting said outlet to admit the said directed portion of circulated fluid to said pressure chamber and separately and non-simultaneously to connect said pressure chamber to said reservoir.

4,566,531
VEHICLE AIR CONDITIONING ARRANGEMENT

Albert Stolz, Tübingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 5, 1983, Ser. No. 539,139
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237275
Int. Cl.[4] B60H 1/12; F25B 29/00
U.S. Cl. 165—42 17 Claims



1. A system for heating a utility space such as a passenger space of a vehicle, the system comprising:

air inlet means for conducting fresh incoming air from a first source of air to the utility space,

air outlet means for conducting outgoing air from the utility space to the outside atmosphere,

a heat exchanger unit disposed in the air inlet means and connected to a cycle that exchanges heat with an engine of the vehicle,

a compression-type air-conditioning unit including an evaporator unit disposed in the air outlet means, a condensor unit disposed in the air inlet means to lie upstream of the heat exchanger unit to aid selectively the heating of the fresh incoming air, and refrigeration line means for transferring heat from the evaporator unit to the condensor unit,

recirculatd air pipe means for selectively conducting outgoing utility space air from a point in the air outlet means upstream of the evaporator unit to a point in the air inlet means upstream of the condensor unit and the heat exchanger unit to mix at least a certain portion of the utility space outgoing air with the fresh incoming air to provide an air mixture, and

an air stream directing means disposed intermediate the air outlet means and the air inlet means for separably and selectively directing the air streams from the air outlet means and the air inlet means into the utility space and the atmosphere, said air stream directing means including means for selectively operating the system to operate in at least:

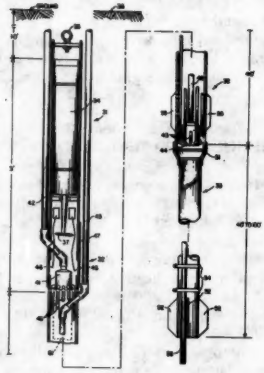
a regular heat condition with the air conditioning unit disabled and the recirculating air pipe means operating so that the air mixture is heated by the heat exchanger unit when the atmospheric temperature outside of the vehicle is low, and

a maximum heat condition with the air conditioning unit operating and the recirculating air pipe means disabled so that only the incoming air is heated sequentially by the condensor unit and the heat exchanger unit when the atmospheric temperature outside of the vehicle is unusually low.

4,566,532
GEOTHERMAL HEAT TRANSFER

Vahan V. Basmajian, Concord, Mass., assignor to Megatech Corporation, Billerica, Mass.

Continuation of Ser. No. 248,964, Mar. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 948,760, Oct. 5, 1978, abandoned. This application Oct. 11, 1983, Ser. No. 540,693
Int. Cl.[4] F24J 3/02
U.S. Cl. 165—45 12 Claims



1. Geothermal heat transfer apparatus comprising,

heat exchanging means for orientation in the earth below ground substantially vertically and having a hollow conduit of length from top to bottom much greater than the span across said hollow conduit orthogonal to its length

having a top portion near said top, bottom portion near said bottom and an intermediate portion contiguous and communicating with said top and bottom portions for allowing thermally conductive fluid to flow freely between said top, intermediate and bottom portions for immersion in thermally conductive fluid in the region around said heat exchanging means for increasing the heat flow between the latter and earth when inserted into a substantially vertical borehole in the earth with said top portion above said bottom portion,

said heat exchanging means comprising heat exchanging conduit means in said intermediate portion for carrying refrigerant,

said heat exchanging conduit means comprising a plurality of tubes of thermally conductive material for carrying said refrigerant and extending along the length of said hollow conduit for a tube length that is less than said length of said hollow conduit.

said hollow conduit being formed with port means between said top and said plurality of tubes for allowing said thermally conductive fluid to pass in a flow path embracing said plurality of tubes, said bottom portion, an outer channel around said hollow conduit and said port means.

4,566,533

APPARATUS FOR CLEANING HEAT EXCHANGER PIPES AND METHODS OF OPERATING AN APPARATUS OF THIS TYPE

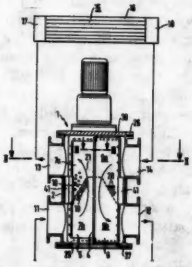
Rolf Bochinski, Duisburg; Klaüs Eimer, Ratingen; Harald Littek, Essen, and Johannes Nasse, Hattingen, all of Fed. Rep. of Germany, assignors to Taprogge Gesellschaft mbH, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 471,014

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207466

Int. Cl.⁴ F28G *1/12*

U.S. Cl. 165—95 **28 Claims**



1. An apparatus for cleaning heat exchanger pipes by means of elastic, spherical balls, comprising a vertical cylindrical housing, three rotatable dividing walls radially-extending from a vertical axis and defining three chambers each occupying substantially 120° in said housing, said dividing walls separating said housing into three chambers of substantially equal size each having a given cross-sectional area, a sieve plate disposed substantially horizontally across said dividing walls, said sieve plate dividing said chambers into an upper group of sub-chambers for receiving the balls and a lower group of sub-chambers, a lower cooling water supply connection and a lower cooling water removal connection in communication with said lower group of sub-chambers at opposite locations on said housing, an upper cooling water supply connection and an upper cooling water removal connection being in communication with said upper group of sub-chambers at opposite locations on said housing, and means for communicating said upper connections to the heat exchanger pipes, all of said connections each having substantially said given cross-sectional area, and said connections each having a diameter being less than the length of a chord of the circumference of said housing described by a central angle of at most 60°, whereby one of said sub-chambers of said upper group may be positioned as an idle chamber wherein the balls therein are out of communication with the heat exchanger pipes.

4,566,534

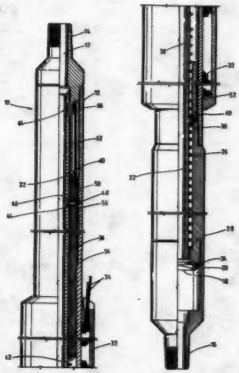
SOLENOID ACTUATED WELL SAFETY VALVE

Walter S. Going, III, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Feb. 1, 1985, Ser. No. 697,544

Int. Cl.⁴ E21B *34/06, 34/16*

U.S. Cl. 166—66.4 **13 Claims**



1. A solenoid actuated well safety valve comprising,

a housing having a bore,

a valve closure member in the bore moving between open and closed positions,

a tubular member telescopically movable in the housing for controlling the movement of the valve closure member,

biasing means acting on said tubular member for moving the tubular member in a direction to close said valve,

an armature movable in the housing,

a solenoid coil positioned adjacent the housing for moving the armature,

first releasable lock means for connecting the armature to the tubular member whereby movement of the armature by the solenoid will op n the valve, and said first lock means being released when the valve is opened, and

second releasable lock means for locking the tubular member in the open position prior to the release of the first lock means.

4,566,535

DUAL PACKER APPARATUS AND METHOD

Lawrence Sanford, 4047 Hollister, Houston, Tex. 77080

Filed Sep. 20, 1982, Ser. No. 420,324

Int. Cl.⁴ E21B *23/06, 33/124, 43/00*

U.S. Cl. 166—113 **36 Claims**

1. Dual packer apparatus comprising:

a tubular outer assembly having an inner diameter which varies along its length and comprising

an upper packer,

a lower packer,

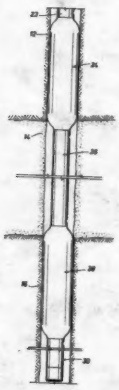
and tubular spacer means interconnecting said upper and

lower packers and longitudinally spacing said packers from each other;

said outer assembly further defining a respective packer set chamber associated with each of said packers for receipt of fluid whereby said packers may be set;

and a tubular inner assembly having an interior throughbore and an exterior periphery, said inner assembly having an outer diameter which varies along its length, said inner assembly being disposed generally coaxially within said outer assembly and interconnected with said outer assembly for relative telescopic movement of said assemblies between a plurality of relative positions, said inner assembly being adapted for coaxial connection to a well conduit whereby fluid may be directed through such well conduit into said interior throughbore, and said inner assembly defining fluid passage means communicating the interior throughbore with the exterior periphery of said inner assembly, and said fluid passage means further being selectively communicatable with said packer set chambers;

and wherein for each of said relative positions, the inner diameter of said outer assembly, at each point along its



length, is greater than the outer diameter of said inner assembly at an adjacent point along its length and all points therebelow.

33. A method of assembling a dual packer apparatus comprising the steps of:

assembling a tubular outer assembly comprising upper and lower packers interconnected and longitudinally spaced apart by tubular spacer means;

supporting said outer assembly on first support means;

assembling a tubular inner assembly, through which said packers may be inflated, separately from said outer assembly;

supporting said inner assembly on second support means as assembled;

lowering said inner assembly generally coaxially into said outer assembly as assembled;

interconnecting said inner and outer assemblies after the entirety of said inner assembly has been so lowered;

and releasing said first support means and supporting said interconnected inner and outer assemblies on said second support means.

4,566,536

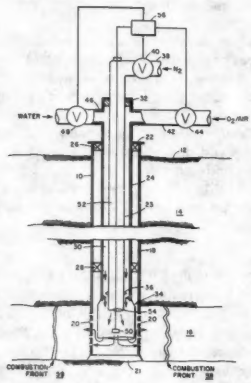
METHOD FOR OPERATING AN INJECTION WELL IN AN IN-SITU COMBUSTION OIL RECOVERY USING OXYGEN

Billy G. Holmes, Lancaster, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 553,925, Nov. 21, 1983, abandoned. This application Oct. 29, 1984, Ser. No. 665,869

Int. Cl.[4] E21B *47/00, 43/243*

U.S. Cl. 166—251 13 Claims



1. A method for operating an injection well to control hazardous conditions in an in-situ combustion operation utilizing high concentrations of oxygen for the recovery of oil from a subterranean, oil-containing formation penetrated by at least one injection well and at least one spaced-apart production well comprising the steps of:

(a) completing the injection well with a casing means containing passages throughout a substantial portion of the vertical thickness of the oil-containing formation to allow fluids to flow from the casing means to the oil-containing formation, and dual concentric tubing strings disposed within said casing means comprising an inner tubing and a larger diameter outer tubing the lower ends of which are in fluid communication with the portion of the casing containing passages, said inner tubing forming a first flow path and the inner tubing cooperating with the outer tubing to form a second flow path;

(b) initiating an in-situ combustion front into the formation by injecting air into the portion of the casing containing the passages through one of the flow paths and from there through the passages into the formation;

(c) continuing injection of said air into the formation until the combustion front has been moved a predetermined distance into the formation;

(d) terminating injection of air and injecting oxygen enriched air into the portion of the casing containing the passages through one of the flow paths and from there through the passages into the formation;

(e) simultaneously injecting nitrogen at a predetermined injection rate into the portion of the casing containing passages via the other flow path where it combines with the oxygen enriched air and then flows into the formation through the passages of said casing means;

(f) continuously measuring the bottomhole temperature of the injection well within the casing means in the vicinity of the oil-containing formation and located below the first flow path;

(g) increasing the oxygen concentration of the oxygen enriched air to essentially pure oxygen;

(h) terminating the injection of the oxygen enriched air or essentially pure oxygen through its respective flow path

when the bottomhole temperature rises to an upper specific temperature and simultaneously increasing the flow rate of nitrogen through its respective flow path into the formation to a maximum rate; and

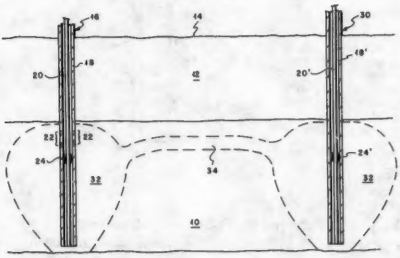
(i) continuing injection of nitrogen through its respective flow path at a maximum rate until the bottomhole temperature is lowered to a lower specific temperature.

4,566,537

HEAVY OIL RECOVERY

Gene L. Gussis, Plano, Tex., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Filed Sep. 20, 1984, Ser. No. 652,380
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—261 **12 Claims**



1. A method for the recovery of viscous, immobile oil from a subsurface formation bearing said oil wherein there are at least two wells completed into said formation comprising:

(a) injecting steam into said formation by way of a first of said wells for a period of time;

(b) ceasing injection of steam by way of said first well;

(c) producing fluids from said formation through said first well, thereby creating voidage in said formation adjacent said first well;

(d) injecting steam into said formation by way of a second of said wells for a period of time;

(e) ceasing injection of steam by way of said second well;

(f) producing fluids from said formation through said second well, thereby creating voidage in said formation adjacent said second well;

(g) subsequently injecting an oxygen-containing combustion supporting gas into the top of said formation and creating a combustion front in the top of said formation;

(h) continuing injection of said oxygen-containing combustion-supporting gas into the top of said formation at least until measurable oxygen breaks through at said second well;

(i) ceasing injection of said oxygen-containing combustion supporting gas;

(j) thereafter injecting steam into the lower part of said formation by way of said first well, and

(k) producing oil at said second well.

4,566,538

FAIL-SAFE ONE TRIP PERFORATING AND GRAVEL PACK SYSTEM

Elmer R. Peterson, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

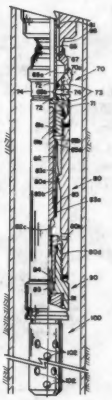
Filed Mar. 26, 1984, Ser. No. 593,426
Int. Cl.[4] E21B *43/08, 43/116*
U.S. Cl. 166—278 **17 Claims**

1. A combined gravel packing and perforating apparatus insertable in a cased well by a tubing string, said apparatus including: a fluid pressure operated packer, a screen dependent therefrom and a perforating gun and firing assembly suspended below said screen; said packer being settable by fluid pressure in said casing string; means responsive to internal fluid pressure in said firing assembly for firing said perforating gun; and a crossover tool disposed below said packer to direct casing annulus fluid pressure to the interior of said firing assembly, whereby said perforating gun may be fired by fluid pressure without setting said fluid pressure operated packer.

10. The method of perforating and gravel packing the production zone of a subterranean well with one trip of a tubing conduit, comprising the steps of:

assembling at the surface for attachment to the end of a tubing conduit: first and second packer means carried on said tubing conduit; screen means dependent from said tubing conduit; a perforating gun and firing assembly suspended below said screen means; and means responsive to said fluid pressure and said firing assembly for firing said perforating gun whereby said perforating gun may be fired by fluid pressure without setting said packer means;

lowering the tubing conduit with the above listed components thereon into the well until the perforating gun is positioned adjacent to the desired production zone;



setting the first packer means in a position above the desired production formation with said perforating mechanism adjacent the desired production zone;

increasing the fluid pressure in the well annulus to a level sufficient to actuate said firing assembly;

releasing said first packer and lowering the tubing string to position said screen adjacent the perforated production zone, and then resetting said first packer; increasing the fluid pressure in the tubing string to a level sufficient to cause setting of said second packer; and

introducing gravel carrying fluid through the tubing string to flow downwardly along the casing annulus between the first and second packers, through the screen, and upwardly through the tubing string to the casing annulus at a point above said second packer.

4,566,539

COAL SEAM FRACING METHOD

William Perlman, 2302 Niels Esperson Bldg., Houston, Tex. 77002

Filed Jul. 17, 1984, Ser. No. 631,592
Int. Cl.[4] E21B *43/267, 43/27*
U.S. Cl. 166—307 **34 Claims**

1. A method for fracturing a gas-containing subsurface coal formation penetrated by a well, comprising the steps of:

injecting a fracing fluid into the formation adjacent the well in a multiplicity of stages, said fracing fluid having suspended therein fine proppants with a particle size distribution substantially between 60 and 140 mesh, said fine

proppants added to said fluid at a rate ranging from about 2 to about 12 pounds per gallon of said fluid; and

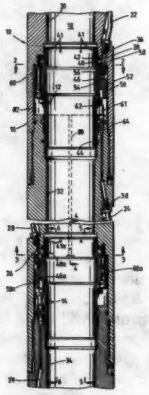
injecting an acidizing solution into the formation adjacent the well immediately following each of said fracing fluid injection stages, said injections of fracing fluid and acidizing solution being at a rate of from about 15 to about 35 barrels per minute and continuing until at least 3,000 pounds of said fine proppants have been deposited in the formation fracture per linear vertical foot of the formation.

4,566,540

HYDRAULICALLY ACTUATED CONTROL FLUID COMMUNICATION NIPPLE

Ronald E. Pringle, and William D. Eatwell, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Jun. 25, 1984, Ser. No. 624,431
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—317 **12 Claims**



1. A hydraulic control fluid communication nipple for switching control fluid from one location to a second location in a well tool comprising,

a body having a longitudinal bore therethrough,

a fluid passageway in the body offset from the bore adapted to be connected to the well surface for receiving hydraulic control fluid for normally supplying control fluid to a first location,

vertically moving means in the body for opening communication of said fluid passageway to the bore,

a hydraulic piston vertically movable in the body and connected to said vertically moving means, said piston movable in said passageway, said piston including means responsive to control from the well surface for moving the vertically moving means and switching control fluid from the fluid passageway to the bore, and

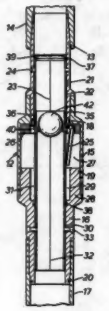
said piston includes a bypass opening therethrough, and said opening including a seat adapted to receive a valve element therein for closing said opening.

4,566,541

PRODUCTION TUBES FOR USE IN THE COMPLETION OF AN OIL WELL

Jacques L. Moussy, Boulogne, and Jean A. Lescoeur, Paris, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Oct. 15, 1984, Ser. No. 660,671
Claims priority, application France, Oct. 19, 1983, 83 16613
Int. Cl.[4] E21B *34/10, 34/14*
U.S. Cl. 166—318 **5 Claims**



1. A connector for insertion in a production tube for use in the completion of an oil well by installation in a casing of the oil well, the production tube being provided with a sealing device, called a packer, to close the annular space between the production tube and casing, and by installation of a well head for production purposes, said connector being intended to be inserted in the production tube below the packer and comprising a first retractable ball seat which, when closed by a ball, makes it possible to admit a pressurised fluid into the inner space within the production tube and which is adapted to be moved away as a result of axial displacement and radial expansion under the action of an excess pressure in the inner space, a closing flap arranged so as to close when said first seat is moved away under the action of the said excess pressure, in order to provide a safety device during the installation of the well head, and, above said flap, a second seat which, when closed by a second ball and subjected to a pressurised fluid in the inner space, is adapted to be moved away as a result of axial displacement and radial expansion and to cause said flap to open and be maintained in the open position, in order to put the well in a state of production.

4,566,542

FIRE PROTECTION SYSTEM FOR AIRCRAFT

William A. Enk, 1213 Horizon, Blue Springs, Mo. 64015, and Ronald P. Migis, Blue Springs, Mo., assignors to William A. Enk, Blue Springs, Mo.

Division of Ser. No. 324,698, Nov. 25, 1981, Pat. No. 4,482,018.
This application Aug. 3, 1984, Ser. No. 637,543
Int. Cl.[4] A62C *35/12*
U.S. Cl. 169—62 **8 Claims**

1. A fire protection system for a vehicle such as an aircraft presenting therein at least first, second and third fire zones, said system comprising:

first and second three way valves each having an inlet port for receiving extinguishant, a first outlet port connected with the inlet port when the valve is in a first state, and a second outlet port connected with the inlet port when the valve is in a second state;

means for continuously connecting said first outlet port of the first valve with the inlet port of the second valve and the second outlet port of the first valve continuously with the first fire zone;

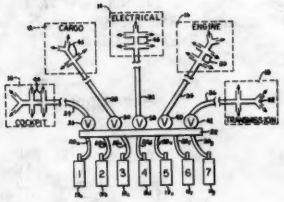
means for connecting the first and second outlet ports of the

second valve with the respective second and third fire zones;

a plurality of containers each holding extinguishant;

a manifold line connected with each container to receive the extinguishant discharged therefrom, said manifold line being continuously connected with the inlet port of the first valve to apply extinguishant thereto when a container is discharged;

switch means for selecting one of the fire zones to receive extinguishant, said switch means being selectively operable to effect the second state of said first valve to establish



an extinguishant flow path from said manifold line through the first valve to the first fire zone, to effect the first state of both valves to establish an extinguishant flow path from said manifold line through both valves to the second fire zone, and to effect the first state of the first valve and the second state of the second valve to establish an extinguishant flow path from said manifold line through both valves to the third fire zone; and

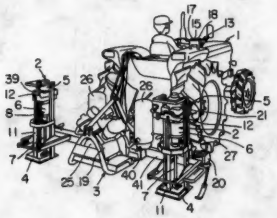
means for discharging each container to apply the extinguishant therein to said manifold line and said inlet port of the first valve and from there to the fire zone selected by the switch means.

4,566,543

AERATOR CARRIED BY AUTOMOTIVE VEHICLE AND CONTROL SYSTEM THEREFOR

Masutoshi Kotani, Osaka, Japan, assignor to Iwatani & Co., Ltd., Japan

Filed Aug. 10, 1983, Ser. No. 521,932
Int. Cl.[4] A01B *45/02, 63/114;* A01C *23/02*
U.S. Cl. 172—4 **4 Claims**



1. An aerator which is carried by an automotive vehicle, and movable vertically, which aerator comprises:

(a) a spike pipe;

(b) a spiking means for driving the spike pipe from a "high" position above the ground into the soil said spiking means including an air hammer means for driving the spike pipe into the ground after the spiking means has lowered the spike pipe into ground contact;

(c) an extraction means for pulling the spike pipe out of the soil to a predetermined height above the ground; and

(d) a control system including:

i. a "start" commanding device for sending a "start" command for actuating the spiking means,

ii. an aeration depth detector for detecting when the spike pipe has been driven a predetermined depth into the soil and for stopping the actuation of the spiking means upon such detection,

iii. an "end" commanding device for sending an "end" command for actuating the extraction means to pull the spike pipe out of the soil to a predetermined height above the ground,

iv. a compressed air source including an air compressor, an air tank connected with the air compressor, an accumulator, an air supply channel connecting the air tank with the accumulator, and an air channel connecting the air tank with the air hammer means and the extraction means, and

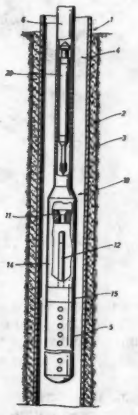
v. a check valve disposed in the air supply channel for preventing backflow of air to the air tank.

4,566,544

FIRING SYSTEM FOR TUBING CONVEYED PERFORATING GUN

James T. Bagley, Sugar Land, Tex., and Maurice L. Simon, Breaux Bridge, La., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 29, 1984, Ser. No. 665,795
Int. Cl.[4] E21B *43/11*
U.S. Cl. 175—4.56 **8 Claims**



1. A system for firing a tubing conveyed perforating gun suspended in a well utilizing a drop bar and comprising:

(a) a percussion activated firing means attached between a tubing string and at least one perforating gun, said firing means including a first end adjacent the tubing string for receiving an activating force and a second end adjacent said at least one perforating gun for transmitting an explosive force to said at least one perforating gun;

(b) a drop bar for introducing into the tubing and contacting the first end of said firing means, said drop bar including a housing with an attached stop means, a mandrel movably attached to the housing, and a contacting end attached to the mandrel and movable in relation to the stop means, said drop bar further comprising a retracting means for moving the contacting end toward the stop means after the retracting means is activated;

(c) guide means for receiving said drop bar and directing said contacting end toward the first end of said firing means; and,

(d) abutment means fixed in relation to said firing means for receiving said stop means, whereby after said retracting

means is activated said retracting means moves the contacting end of said drop bar toward said stop means to such an extent that contact of the stop means and the abutment means prevents the contacting end of the drop bar from reaching and detonating the firing means, so that the drop bar may be safely fished from the tubing or the guns safely removed from the well in the event of a misfire.

4,566,545

CORING DEVICE WITH AN IMPROVED CORE SLEEVE AND ANTI-GRIPPING COLLAR WITH A COLLECTIVE CORE CATCHER

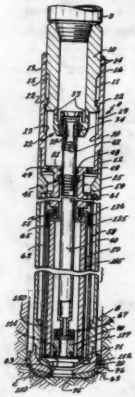
Arthur L. Story, Butte, Mont., and Michael Filshtinsky, Salt Lake City, Utah, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Sep. 29, 1983, Ser. No. 537,115

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ E21B *25/06*

U.S. Cl. 175—226 **18 Claims**



1. An improved coring apparatus used in combination with a coring bit and drill string comprising:

an outer driving structure adapted to be connected at one end to said coring bit for cutting a core in a bore hole, and at the other end to the lower end of said drill string in telescoping and co-rotatable manner therewith;

an inner barrel disposed within said outer driving structure and including a lower end portion adjacent to said bit;

first means supporting said inner barrel in spaced relationship to said outer driving structure while permitting rotation of said driving structure with respect to said inner barrel;

a woven metal mesh sleeve mounted in surrounding relation on at least a portion of the exterior surface of said inner barrel, said sleeve including a leading portion adapted to be positioned within the inner barrel and initially to receive a core as it is cut, said sleeve having a predetermined normal diameter which is greater than the diameter of the sleeve in tension;

second means, connected to a free end of said sleeve opposite said leading portion of said sleeve, for maintaining the portion of said sleeve which surrounds said inner barrel in compression and to maintain an inside diameter greater than the outside diameter of said inner barrel of said portion of said sleeve surrounding said inner barrel while the portion of said sleeve positioned inside said inner barrel being in tension to grip and compress a core received within said sleeve and having an outside diameter less than the inside diameter of said inner barrel when in tension, wherein said second means is also for engaging said core when said means is drawn into said inner barrel, and

third means positioned within said inner barrel and connected to the leading portion of said sleeve to draw said sleeve within said inner barrel and to apply tension to the portion of said sleeve within said barrel to encase and grip said core as it is cut.

4,566,546

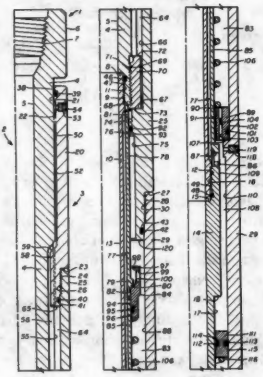
SINGLE ACTING HYDRAULIC FISHING JAR

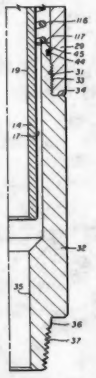
Robert W. Evans, Elkins Lake Box 428, Huntsville, Tex. 77340

Continuation of Ser. No. 443,605, Nov. 22, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 648,711

Int. Cl.⁴ E21B *4/14*

U.S. Cl. 175—297 **20 Claims**





1. A fluid actuated fishing jar comprising

a pair of tubular members positioned in telescoping relation for limited longitudinal movement of one relative to the other and adapted for connection of one tubular member to a drill pipe and the other tubular member to an object to be dislodged from a well,

means defining a chamber between said tubular members,

piston means closing said chamber and operatively connected to one of said tubular members for movement thereby,

a substantially incompressible hydraulic fluid filling said

chamber and resisting relative movement of said piston means,

said piston means being movable in one direction to apply pressure to fluid in said chamber upon relative movement between said tubular members in one direction,

one of said tubular members having a valve opening positioned between said piston means and the end of said chamber,

valve means initially closing said valve opening,

fixed abutment means on the other tubular member operatively engagable with said valve means upon a first predetermined relative movement of said piston means in said one direction,

said valve means being movable to open the same on engagement with said abutment means to release fluid from said chamber upon said first predetermined relative movement of said piston means in said one direction and thereby reduce substantially the resistance to further relative movement of said piston means and movement of said tubular members therewith,

means permitting a relatively minute flow of fluid from said chamber during said first predetermined relative movement of said piston means, and

hammer and anvil means engagable with a jarring impact upon said further relative movement of said tubular members.

4,566,547

REMAINING AMOUNT INDICATOR

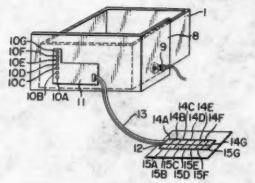
Hideaki Furukawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 363,517, Mar. 30, 1982, abandoned. This application Mar. 21, 1984, Ser. No. 591,885

Claims priority, application Japan, Apr. 10, 1981, 56-52911

Int. Cl.[4] G01G *23/18, 19/52, 23/30;* **G03G** *15/00*

U.S. Cl. 177—46 **12 Claims**



1. A remaining amount indicator comprising:

detecting means for detecting a remaining amount of recording paper by sensing a position of a loading member on which the recording paper is loaded, wherein said position varies in accordance with the amount of recording paper on said loading member;

display means for displaying the remaining amount of recording paper; and

control means for controlling said display means in accordance with the output of said detecting means so that said display means performs a progressive display of the remaining amount of recording paper on said loading member.

4,566,548

ANALYTICAL BALANCE

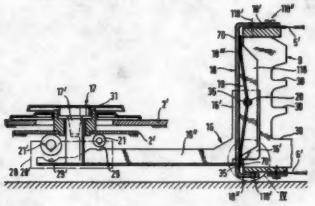
Walter Södler, Göttingen; Erich Knothe, Bovenden; Günther Maaz, Uslar-Wiensen, and Joachim Mädge, Brunswick, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,344

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330988

Int. Cl.[4] G01G *3/08, 21/00, 21/10, 1/18*

U.S. Cl. 177—229 **8 Claims**



1. Analytical balance with pan on top with a four-bar mechanism which keeps the balance pan parallel horizontally during its vertical travel, the one vertical side of which is held fast to the housing, the other vertical side of which, in the form of a coupling piece, carries an extension which receives the pan, and both horizontal sides of which are connected in an articulated manner by an upper and a lower rod to the vertical sides, whereby the four-bar mechanism is loaded by the restoring force of a load converter, characterized in that the extension (16) which receives the pan (17) is L-shaped, the horizontal L-shank (16″) carries the pan (17) rigidly connected to its free end and the vertical L-shank bearing arm (16′) is mounted on the bar (18‴) of a U-shaped arm bearing (18) which projects above and below over the vertically movable end (9) of the four-bar mechanism (5, 6, 7, 8, 9) with its two horizontal U-shanks (18, 18″) in the rod planes and is rigidly fastened to it in two vertically superposed bearings (118′).

4,566,549

WEIGHING HOPPER CLEANING DEVICE

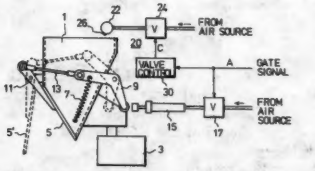
Yasushi Oshima, Akashi, Japan, assignor to Yamato Scale Company, Limited, Japan

Filed Mar. 23, 1984, Ser. No. 592,418

Claims priority, application Japan, Mar. 28, 1983, 58-45505

Int. Cl.[4] G01G *13/18, 19/00, 23/00*

U.S. Cl. 177—245 **4 Claims**



1. A weighing hopper having a discharge gate, gate control means responsive to a gate control signal for opening the gate for unloading of product from the hopper, at least one air jetting nozzle directed toward the interior of the hopper, and jetting nozzle control means responsive to said gate control signal to initiate operation of said air jetting nozzle to blow air into the interior of the hopper only after a predetermined delay following opening of the gate sufficient to permit completion

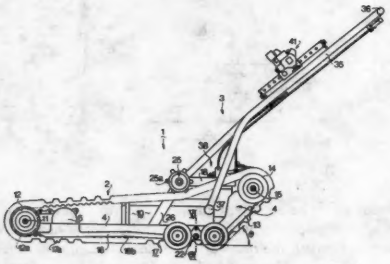
of unloading of product from the hopper whereby said nozzle is adapted to blow air into the interior of the hopper after it has unloaded to clean it.

4,566,550

STAIR-CLIMBING WHEELCHAIR CARRIER

Rintaro Misawa, Tokorozawa, Japan, assignor to Sunwa Sharyo Manufacturing Co., Ltd., Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,801
Claims priority, application Japan, Oct. 7, 1983, 58-188112
Int. Cl.⁴ B62B *5/02*
U.S. Cl. 180—8.2 **3 Claims**



1. A stair-climbing wheelchair carrier comprising:
a frame body;
a pair of rail frames formed in a lower portion of said frame body, rear ends of said rail frames having sleigh-like upward portions;
wheels disposed on said frame body;
a handle portion provided on said frame body;
a wheelchair holding device provided on said handle portion for holding a wheelchair;
a pair of endless belt crawlers engaged with said wheels on said frame body and with said rail frames;
said endless belt crawlers having a predetermined span extending two steps of a stairway and an oblique overhang portion at one end of said frame body which has predetermined height higher than the usual height of a step of the stairway;
a travelling wheel mechanism provided on each of said rail frames, said travelling wheel mechanism comprising a lever rotatably mounted on said rail frame, a pair of travelling wheels provided on both ends of said lever, and a spring for maintaining said travelling wheels in a position, the travelling wheels being so disposed that contact points thereof with the ground are at lower positions than a grounding surface of said crawlers.

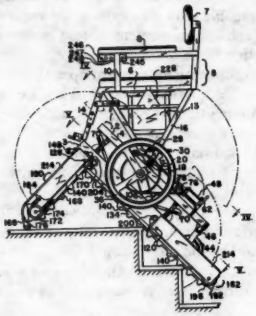
4,566,551

STAIR-CLIMBING CONVEYANCE

Jack M. Feliz, 2110 Southridge Dr., Palm Springs, Calif. 92264

Filed Aug. 30, 1983, Ser. No. 527,766
Int. Cl.⁴ B62D *55/04*
U.S. Cl. 180—9.1 **24 Claims**

1. In a load carrying conveyance, the combination of:
(a) a platform to receive the load;
(b) main drive and caster wheels supporting the platform for mobility;
(c) main endless belt tractor means supporting the platform for mobility;
(d) lever means carrying auxiliary endless belt tractor means disposed on pivots forwardly and rearwardly on the platform and outwardly off-set from the main tractor means and said platform to be operatively clear of said main tractor means and platform to permit rotation of said auxiliary tractor means without interference contact with said main tractor means or platform;
(e) power mechanism manually controllable by an operator for driving the drive wheels and the several tractor means, with said power mechanism operatable at a constant speed;
(f) rotational means for rotating said lever means concentrically positioned with said pivots and means for driving said rotational means; and



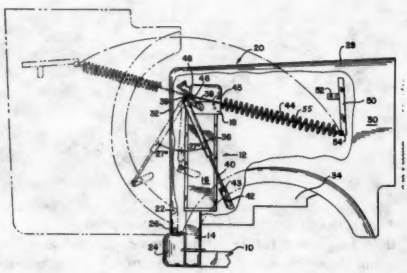
(g) mode conversion jack means manually controllable by the platform occupant for lowering the main endless belt tractor means until said main endless tractor belt means are in contact with the floor, and subsequently raising the main drive and caster wheels above the roots of the main endless tractor belt means, thus simultaneously converting the conveyance from a higher speed, level surface mode, to a lower speed, higher torque, stair climbing mode or vice versa, while remaining engaged to the main power mechanism operating at constant speed.

4,566,552

HOOD TILT RETARDATION SYSTEM

Lawrence A. Hoffman, Hoagland; Jay P. Hacker, and William M. Miller, both of Fort Wayne, all of Ind., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 16, 1983, Ser. No. 552,582
Int. Cl.⁴ B62D *25/10*
U.S. Cl. 180—69.21 **12 Claims**



1. A hood tilt assist system for a motor vehicle including a supporting framework, said system comprising:
an engine covering hood pivotally mounted at its front lower portion to an immobilized part of said framework and reciprocably moveable through a hood-over-center position between open and closed positions;
stop means operatively associated with said hood to stop the travel of said hood and defining respectively said open and closed positions;

upstanding means rigidly attached to and extending upwardly from said framework to a level disposed substantially above the lowest portion of said hood in both its open and closed positions;

dashpot retardation means secured to said upstanding means and said hood for reducing the speed of hood travel toward both said open and said closed positions, said retardation means being operative between said hood-over-center position and said open and closed positions defined by said stop means, said retardation means providing an unrestricted displacement of said hood prior to said hood passing said hood-over-center position; and

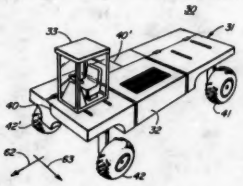
means for equiangular and equidistant displacement of said retardation means relative to said hood-over-center position in either direction.

4,566,553

AGRICULTURAL WORK VEHICLE

Arnold E. McCutcheon, 627 Churchill Dr., Winnipeg, Manitoba, Canada (R3L 1W4)

Filed Sep. 6, 1984, Ser. No. 647,653
Claims priority, application Canada, Oct. 17, 1983, 439086
Int. Cl.⁴ B60K *17/30*
U.S. Cl. 180—237 **35 Claims**



1. An agricultural work vehicle having an extensible load supportive frame, an operator's cab rotatably mounted on the frame and adapted to face the direction of travel, motive power means carried by the frame and ground engaging wheel means selectively controllable from the cab and drivable by the power means for rollably supporting the frame, comprising:

a fixed frame member having a coplanar first sleeve portion;

a slidable frame member having a longitudinal arm portion adapted to slidably engage the sleeve;

an articulated frame member hingedly connected with individual ones of the fixed and slidable frame members in the plane of the sleeve and extending orthogonally thereto; and

hydraulic ram means controllable from the cab for interconnecting and mutually displacing the fixed and slidable frame members, thereby altering the dimensions of the frame.

4,566,554

FOUR WHEEL DRIVE SYSTEM WITH CENTER DIFFERENTIAL UNLOCK CONTROL RESPONSIVE TO STEERING ANGLE

Kunihiko Suzuki, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Apr. 16, 1984, Ser. No. 597,707
Claims priority, application Japan, May 9, 1983, 58-81583
Int. Cl.⁴ B60K *17/35*
U.S. Cl. 180—249 **11 Claims**

1. A four-wheel drive vehicle comprising:

an engine,

front wheels and rear wheels,

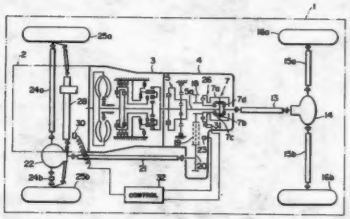
a four-wheel drive system for transmitting power from said engine to said front wheels and said rear wheels, said four-wheel drive system comprising a center differential, connected between said front wheels and said rear wheels, for absorbing a rotational speed difference between said front wheels and said rear wheels, and center differential restraining means capable of holding said center differential in a first condition in which the function of said center differential is restrained and in a second condition in which said center differential is released, and

a control system comprising:

means for sensing a steering angle of at least one steerable wheel of the vehicle,

condition sensing means for detecting whether said center differential is in said first condition or not, and

control means, connected with said steering angle sensing means and said condition sensing means, for controlling said center differential by actuating said center differential restraining means in accordance with signals of said steering angle sensing means and said condition sensing means,



said control means being arranged to command said center differential restraining means to bring said center differential from said first condition toward said second condition if the sensed steering angle is equal to or larger than a predetermined angle and at the time said center differential is in said first condition,

said center differential comprising a front-side rotating member connected to said front wheels for driving said front wheels and a rear-side rotating member connected to said rear wheels for driving said rear wheels, said center differential being capable of allowing said front-side and rear-side rotating members to rotate at different speeds, said front-side and rear-side rotating members being prevented from rotating at different speeds when said center differential is in said first condition.

4,566,555

VEHICLE CONTROL SAFETY SYSTEM

Samuel L. Schlanger, 140 Cheyenne Way, Wayne, N.J. 07470

Filed Feb. 13, 1984, Ser. No. 579,690
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Int. Cl.⁴ B60R *21/00*
U.S. Cl. 180—274 **28 Claims**

1. A safety system for a vehicle having a chassis with two parallel substantially horizontal spaced-apart lower chassis frame extension legs and two parallel substantially horizontal spaced-apart upper chassis frame extension legs associated with the front and rear ends of said vehicle and an axle assembly for each of the wheels, comprising:

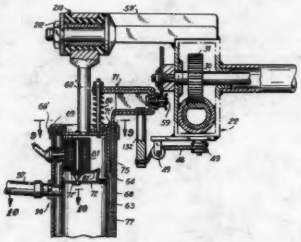
a suspension assembly for each axle assembly including a cylinder and an air piston normally movable in said cylinder, said cylinder being pivotably coupled to said chassis and said air piston being pivotably coupled to said axle assembly, said cylinder being formed with at least one air port opening;

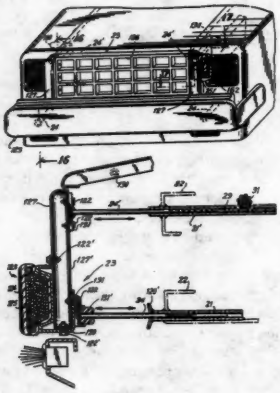
valve means for selectively opening and closing said at least one air port opening so as to arrest the movement of said air piston in said cylinder, and to maintain said piston in a relatively rigid, non-compressible state when said air port opening is closed, including biasing means urging said valve means to open said air port opening;

means for activating the closing of said valve means; and

at least one bumper assembly including a short stroke re-

tractable bumper slidably mounted on said chassis for movement between a normal, extended position and a retracted position, by means of a first pair of generally parallel, spaced-apart hollow support arms, each of which being mounted to one of said lower chassis frame extension legs and a second pair of generally parallel, spaced-





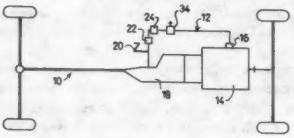
apart hollow support arms, each of which being mounted to one of said upper chassis frame extension legs, and a pair of lower and a pair of upper generally parallel, spaced-apart rods connected to said bumper, each of which being telescopically received in a corresponding one of said hollow support arms.

4,565,556

ANTI-THEFT APPARATUS FOR MOTOR VEHICLES

Josef Wodeslavsky, Tenafly, N.J., assignor to Autoloc Corporation, Tel Aviv, Israel

Continuation-in-part of Ser. No. 430,591, Sep. 30, 1982, abandoned. This application May 4, 1984, Ser. No. 607,801
Claims priority, application Israel, Aug. 19, 1983, 69527
Int. Cl.[4] B60R *25/04*
U.S. Cl. 180—287 **14 Claims**



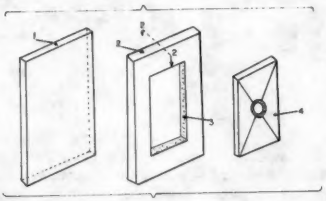
1. Anti-theft apparatus for a motor vehicle, including a vacuum source for generating a vacuum when the vehicle engine is running, said anti-theft apparatus comprising: a disabling device for disabling normal operation of the vehicle; a releasing device for releasing said disabling device to permit normal operation of the vehicle; and a vacuum control device between said vacuum source and said releasing device, said vacuum control device including a cylinder and a piston receivable therein, one of said cylinder and piston constituting a key manually removable by the operator whenever it is desired to disable the normal operation of the vehicle, and a vacuum connection from said vacuum source to said releasing device via said cylinder, said cylinder and piston including bores located so as to become aligned, and thereby to establish a vacuum connection through said cylinder, only when said key is in said vacuum control device.

4,566,557

FLAT ACOUSTIC DIFFUSER

Guy Lemaitre, 7 Chemin de la Foux Le Revest des Eaux, 83200 Toulon, France

Filed Mar. 9, 1984, Ser. No. 588,008
Claims priority, application France, Mar. 9, 1983, 83 04176
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—150 **13 Claims**



1. An acoustic device comprising:

a frame bordering an area open to the front and rear of the frame;

a speaker located within the area bordered by the frame, said speaker corresponding in size to said area and having a front side and a rear side;

a cover positioned over only the front of the acoustic device so that said front side is covered and said rear side is uncovered, said cover being a direct wave attenuator whereby unattenuated sound waves are emitted from the rear side of the speaker.

4,566,558

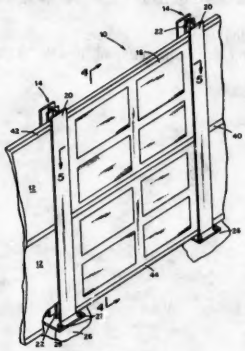
NOISE BARRIER

Julian V. Link, Jr., and Ronald E. Cronan, both of Knoxville, Tenn., assignors to Marine Systems, Inc., Knoxville, Tenn.

Filed Feb. 21, 1985, Ser. No. 703,728
Int. Cl.[4] B64F *1/26*
U.S. Cl. 181—210 **16 Claims**

1. A noise barrier panel for the abatement of transportation-related noise comprising a slab of rigid plastic foam secured to and sandwiched between a first sheet of plastic defining a traffic face and a second sheet of plastic defining a residential face, said slab having two major surfaces and minor surfaces with edges at the intersection of said major and minor surfaces, a plurality of reinforcing members secured to said slab at both of said major surfaces, said reinforcing members extending along each of the edges, at least one recess formed into said

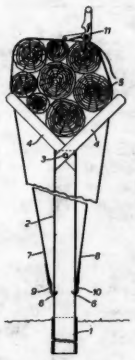
slab adjacent said first sheet to form a chamber, said recess having a perimeter spaced-apart from said reinforcing members, and a sound absorption material contained in said chamber.



4,566,559
SAWING TRESTLE

Christianus M. A. J. van Asten, Energiestraat 5, 5753 RN Deurne, Netherlands

Filed Aug. 28, 1984, Ser. No. 645,101
Claims priority, application Netherlands, Aug. 30, 1983, 8303017
Int. Cl.[4] F16M *11/00*; B27B *21/02*
U.S. Cl. 182—224 **4 Claims**

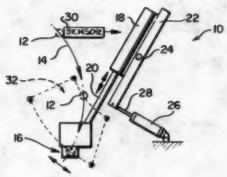


1. A sawing trestle for elongate wooden bodies, comprising:
a single, upwardly extending frame part;
a supporting means having a V-shape when seen along a first direction, said supporting means having a width of about 10 cm in said first direction and being secured to a top end of said frame part, whereby said elongate wooden bodies may be positioned and supported on said V-shaped supporting means with elongate axes of said bodies generally extending in said first direction; and
means for clamping said elongate bodies on said supporting means, said means for clamping comprising two belts, each of said belts having one end attachable to said frame part and a second end, said second ends being connected to a stretching member such that said belts can extend between ends of said supporting means in said first direction and be stretched around bodies supported on said supporting means and adjusted by said stretching member to clamp said bodies.

4,566,560
MOVABLE LUBRICATOR APPARATUS

Kirk W. Elliott; Christian J. Garver; John P. Kayser, all of Madison, and Robert M. Dombroski, McFarland, all of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Continuation of Ser. No. 297,988, Aug. 31, 1981, abandoned.
This application Apr. 18, 1984, Ser. No. 601,119
Int. Cl.[4] F16N *13/22*; B65G *45/02*
U.S. Cl. 184—15.1 **5 Claims**



1. Lubricating apparatus for supplying lubricant through a lubrication coupler to a nonlinearly traveling lubrication point on a conveyor moving along an extended non-linear path, said apparatus comprising:
a frame positionable adjacent said moving conveyor;
coupler means including a coupler assembly having a lubrication coupler at one end thereof to move said coupler into engagement with said lubrication point for dispensing lubricant into said point during movement of said conveyor;
platform means including a platform pivotally mounted to said frame along a pivot axis including longitudinal rod means slidably mounted on said platform and mounted to said coupler assembly for enabling said coupler to move over an extended path over about 50% of the length of said longitudinal rod means in a linear direction with respect to the platform, and restraining means engaged between said platform and said frame to yieldably restrain pivotal movement of said platform;
locating means for locating said non-linearly traveling lubrication point during conveyor movement and adapted for placing said lubrication coupler immediately adjacent said lubrication point into a lubrication ready position;
said locating means including a V-block mounted to said coupler assembly at said one end thereof and having a pair of convergent surfaces defining a nesting position therebetween aligned with said lubrication coupler for nestably, engageably receiving said lubrication point when said lubrication coupler is placed in said lubrication ready position;
said locating means further including fluid operated cylinder means operatively connected to said V-block to move said V-block towards said moving conveyor and into said lubrication ready position immediately prior to said dwell time, and to move the V-block away from the moving conveyor and out of said lubrication ready position at the end of the dwell time;
said coupler being moved by said lubrication point while nestably engaged with said lubrication point, and being enabled by said platform means, rod means and restraining means to move angularly about said platform pivot axis as well as radially with respect to said pivot axis in an outwardly linear direction with respect to the platform in direct engagement response to the non-linear traveling of said lubrication point so as to maintain engagement with said non-linearly traveling lubrication point for a dwell time sufficient to adequately supply lubricant thereto; and
said coupler assembly further including second fluid oper-

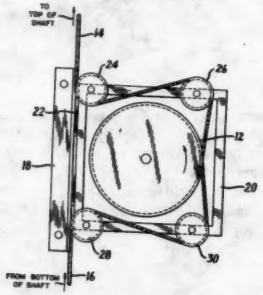
ated cylinder means adapted to move said coupler into and out of engagement with said lubrication point at said nesting position in accordance with the desired dwell time.

4,566,561

SELECTOR CABLING ARRANGEMENT

Richard E. Atkey, Memphis, Tenn., assignor to Dover Corporation, New York, N.Y.

Filed Mar. 28, 1984, Ser. No. 594,232
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—20 11 Claims



1. In an elevator system having a selector mechanism, for simulating the position and movements of the elevator car, and means for actuating the selector mechanism including cable means connected to the car and a take-up drum for winding or unwinding the cable means in sequential rows across the drum, wherein the drum is rotatable about a rotational axis and the lead of the cable means travels across the drum in the axial direction as the drum is rotated; a selector cable guide comprising:

a frame pivotable about a pivot axis generally perpendicular to the rotational axis, the frame having a portion extending from the pivot axis;

a first pulley means mounted to the frame adjacent to the pivot axis; and

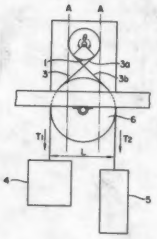
a second pulley means mounted to the frame on the extending portion; wherein the cable means is guided about the first pulley means, the second pulley means, and then onto the drum; wherein the position of the second pulley means adjusts to the lead position of the cable as it travels across the drum, wherein the position of the first pulley means remains substantially stationary, in the direction of the rotational axis, regardless of the position of the second pulley means, and wherein further the cable means comprises a cable having portions extending in opposite directions from the car, the oppositely extending cable portions being connected to the drum to wind in opposite rotational directions of the drum, each being arranged to wind and unwind in sequential rows across the drum, wherein the first pulley means comprises a pair of first pulleys mounted to the frame adjacent the pivot axis, and wherein the second pulley means comprises a pair of second pulleys mounted to the frame on the extending portion, wherein each cable portion is guided about one of the first pulleys and one of the second pulleys and thereafter onto the drum.

4,566,562

TRACTION ELEVATOR APPARATUS

Katsuhiko Suzuki, Nagoya, and Takenobu Honda, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 25, 1983, Ser. No. 460,798
Claims priority, application Japan, Feb. 5, 1982, 57-14905[U]
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—22 5 Claims



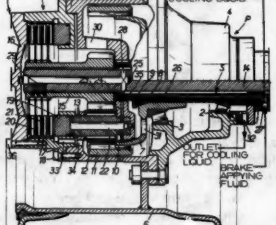
1. A traction elevator apparatus comprising a driving sheave on which a rope is wound, said rope connected to a cage at a first end and to a balance weight at a second end, a deflector wheel having a diameter larger than said driving sheave, said first and second ends of said rope crossing each other on the lower side of said driving sheave intermediate said driving sheave and said deflector wheel and extending over and contacting opposite sides of the circumferential surface of said deflector wheel, a part of the circumferential surface of said deflector wheel being located outside a vertical tangent to said driving sheave a sufficient distance to prevent said cage and said balance weight from interfering with each other.

4,566,563

COMBINED LIVE AXLES AND BRAKE ASSEMBLIES FOR VEHICLES

Jean-Marc Chauveau, Viroflay, and Michel Schmitt, Fresnes, both of France, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 338,879, Jan. 12, 1982, abandoned. This application Nov. 15, 1984, Ser. No. 671,806
Claims priority, application France, Jan. 21, 1981, 81 01035
Int. Cl.[4] B60T *1/06;* F16D *55/18;* B60B *27/02*
U.S. Cl. 188—18 A 8 Claims



1. A combined live axle and brake assembly for vehicles comprising a wheel, a drive shaft, a relatively stationary axle tube within which said drive shaft is housed, inner and outer axially spaced wheel bearings mounted on said axle tube, a hub journalled for rotation on said wheel bearings, said hub being adapted to be driven by said shaft and comprising a mounting for the wheel, and said brake comprising a housing, relatively

rotatable first and second sets of friction members associated with said axle and disposed within said housing in a position outboard of said wheel bearings, said first set of friction members being driven by said shaft, reduction gearing through which said second set of friction members is driven from said shaft at a different speed, first and second axially spaced braking faces provided on outboard and inboard sides respectively of said brake and between which said friction members are adapted to be clamped to apply said brake, an end cover forming an externally removable part of said housing, removal of said end cover providing direct access to said brake, and said end cover comprising the only part of said assembly which has to be removed to achieve said direct access, said end cover having an inner face which constitutes said first braking face, a movable member which is subjected to a brake-applying force, said movable member having an inner face which constitutes said second braking face, and a fluid control system which extends from the interior of said assembly inboard of said bearings to said brake, said fluid control system including at least one piston for producing a brake applying force, a bore in said housing in which said piston works, said bore being disposed outboard of said outer wheel bearing and inboard of said friction members, between said brake and said reduction gearing, whereby said piston is accessible after removal of said cover and said braking members without first demounting said wheel from said hub but leaving said reduction gearing intact, an inlet port for brake-applying fluid located inboard of said wheel bearings, and a duct extending from said inlet port to said bore to supply fluid under pressure to said piston.

7. A combined live axle and brake assembly for vehicles comprising a wheel, a drive shaft, a relatively stationary axle tube within which said drive shaft is housed, inner and outer axially spaced wheel bearings mounted on said axle tube, a hub journalled for rotation on said wheel bearings, said hub being adapted to be driven by said shaft and comprising a mounting for the wheel, and said brake comprising a housing, relatively rotatable first and second sets of friction members associated with said axle and disposed within said housing in a position outboard of said wheel bearings, said first set of friction members being directly driven by said shaft, reduction gearing through which said second set of friction members is driven from said shaft at a different speed, first and second axially spaced braking faces provided on outboard and inboard sides respectively of said brake and between which said friction members are adapted to be clamped to apply said brake, an end cover forming an externally removable part of said housing, removal of said end cover providing direct access to said friction members, and said end cover comprising the only part of said assembly which has to be removed to achieve said direct access, said end cover having an inner face which constitutes said first braking face, a movable member which is subjected to a brake-applying force, said movable member having an inner face which constitutes said second braking face, and a fluid control system which extends from the interior of said assembly inboard of said bearings to said brake, said fluid control system including at least one piston for producing a brake applying force, a bore in said housing in which said piston works, said bore being disposed outboard of said outer wheel bearing and inboard of said friction members, an inlet port for brake-applying fluid located inboard of said wheel bearings, and a duct extending from said inlet port to said bore to supply fluid under pressure to said piston.

4,566,564

DISC BRAKE ASSEMBLY

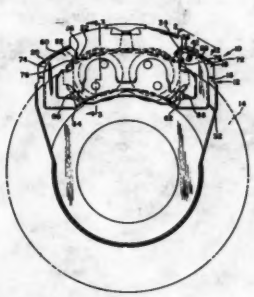
Daniel L. Bolenbaugh, and Robert E. Herzog, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 383,663, Jun. 1, 1982, abandoned. This application Aug. 8, 1984, Ser. No. 638,793

Int. Cl.[4] F16D *65/02*

U.S. Cl. 188—73.33 **2 Claims**

1. A disc brake assembly comprising a torque member fixedly disposed adjacent a rotor to be braked and including a pair of arms extending axially over the periphery of the rotor, a caliper assembly movably carried by the pair of arms and cooperating with an inner friction element and an outer friction element to urge the elements into engagement with the rotor during braking, and the caliper assembly including a pair of axially extending grooves for receiving the pair of arms, each one of said pair of grooves including a slot and said outer friction element including ears received through said slot and disposed in interlocking relation with the walls of said grooves to attach said outer friction element to said caliper assembly, said inner friction element being carried by said torque member in spaced relation to said pair of axially extending grooves, said caliper assembly carrying a hydraulic actuator on one side of



said rotor adjacent said inner friction element, said caliper assembly including a reaction leg extending radially on the other side of said rotor adjacent said outer friction element, said slots intersecting said grooves at points disposed in spaced proximal relationship to said reaction leg, said caliper assembly being movable relative to said torque member in response to wear of said pair of friction elements and said pair of arms overlapping said slots when said pair of friction elements are worn a predetermined amount, and said ears being complementary to and extending, respectively, into said grooves and said ears being provided with substantially arcuate outer edges in alignment with said torque member arms when said outer friction element is attached to said caliper assembly.

4,566,565

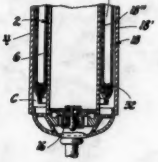
SELF-PRESSURIZED DAMPER

Brian G. Wicke, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1984, Ser. No. 605,628

Int. Cl.[4] F16F *9/43*

U.S. Cl. 188—322.21 **4 Claims**



1. In a method of forming a self-pressurized, hydraulic damper having a working cylinder in flow communication with an adjacent hydraulic fluid reservoir containing a cushioning gas pocket, said method including the principal steps of positioning a dormant gasifiable substance in the reservoir and activating the substance, after assembly of the damper, to generate at least 2 room temperature atmospheres of noncondensible gas in said pocket, the improvement wherein:

said substance comprises a volatile condensed phase of said

gas which is contained under pressure within a rupturable capsule; and

rupturing said capsule to vaporize said substance to generate said gas.

4,566,566

DEVICE FOR TEMPORARILY UNCOUPLING TWO COAXIAL ROTATING ELEMENTS

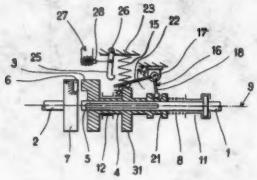
Jean-Pierre Vuillet, Mulhouse, France, assignor to Societe Alsacienne de Construction de Material Textile, France

Filed Sep. 7, 1984, Ser. No. 648,323

Claims priority, application France, Sep. 19, 1983, 83 14835; Jan. 16, 1984, 84 00710

Int. Cl.[4] F16D *11/06*

U.S. Cl. 192—24 11 Claims



1. Device for temporarily uncoupling two coaxial rotating elements, at least one of which is a drive element, by means of a positive clutch which slides on the drive element and which is subjected, in the coupling direction, to the action of a return spring and, in the uncoupling direction, to the effect of an electromagnet, comprising:

(a) an energy storage spring capable of acting on the sliding positive clutch in the direction in which uncoupling is performed, with a force greater than the force of the return spring,

(b) a cam connected to the drive element and designed to tension the said energy storage spring,

(c) a pawl designed to keep the energy storage spring tensioned,

(d) and a mechanical linkage between the pawl and the mobile armature (28,128) of the electromagnet designed to cause the release of the energy storage spring in response to the action of the electromagnet.

4,566,567

OVERRUNNING ROLLER CLUTCH

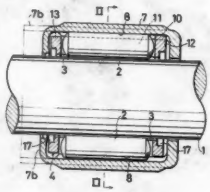
Kiyoshi Miyatake, Osaka, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Oct. 12, 1983, Ser. No. 542,251

Claims priority, application Japan, Oct. 26, 1982, 57-162894[U]

Int. Cl.[4] F16D *3/34*

U.S. Cl. 192—45 10 Claims



1. An overrunning roller clutch comprising rollers each thereof retained in a roller pocket of a cage formed by column portions and annular portions at both ends of the column portions, spring elements assembled with said cage for urging said rollers against corresponding camming surfaces provided in an outer race and an engaging means for engaging said outer race with said cage in the direction of rotation, wherein at least one annular portion of said cage is formed separate from its column portions, there are provided mating projections and recesses in the end faces of said column portions and that of said annular portion to be joined thereto, said projections are fitted in said mating recesses for joining said column portions with said annular portions to form said cage having said roller pockets therein, there are provided a plurality of radial grooves in said ends of said cage and bent lugs provided at both ends of each spring element are engaged in said groove to thereby secure said spring elements to said cage.

4,566,568

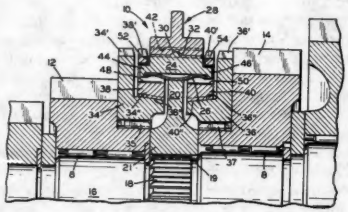
STRUT SYNCHRONIZER FOR TRANSMISSIONS

Kenneth B. Yant, Oregon, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jun. 28, 1983, Ser. No. 508,796

Int. Cl.[4] F16D *11/00*; F16H *3/38*

U.S. Cl. 192—53 F 8 Claims



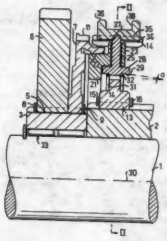
8. A transmission synchronizer comprising a shifting sleeve non-rotatably mounted over a rotatable annular sleeve carrier, said carrier having an axially extending notch in the outer circumference thereof, a pair of blocker rings disposed axially with respect to said carrier, one on either side of said carrier, a strut positioned within said notch, said strut axially engageable with said shifting sleeve for axial movement of said strut into engagement with either of said blocker rings, each of said rings including a slot for receiving respective slot engaging opposed ends of said strut, said strut comprising a pair of opposed axially spaced, radially extending bearing surfaces, each disposed for axially bearing against one side of one of said blocker rings, each of said bearing surfaces separate and distinct from said slot engaging ends of said strut, a leaf spring radially disposed between said strut and said sleeve carrier, said slot engaging ends of said strut defining radially inwardly extending axially spaced abutments for retaining said spring, wherein each of said bearing surfaces comprises an inwardly stepped wall relative to one of said respective slot engaging opposed ends of said strut, each slot comprising a radially outermost enclosure portion for containment and retension of said slot engaging end of said strut under centrifugal and spring forces on said strut, each of said separate bearing surfaces being disposed only for engaging an outer radially extending surface of one of said blocker rings, said radially extending surface being separate and apart from said slot.

4,566,569

SYNCHRONIZING MECHANISM IN A VEHICLE GEARBOX

Leif K. S. Eriksson, Stockholm, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

PCT No. PCT/SE83/00257, § 371 Date Mar. 5, 1984, § 102(e) Date Mar. 5, 1984, PCT Pub. No. WO84/00405, PCT Pub. Date Feb. 2, 1984
PCT Filed Jun. 20, 1983, Ser. No. 598,302
Claims priority, application Sweden, Jul. 13, 1982, 8204297
Int. Cl.⁴ F16D *11/00*
U.S. Cl. 192—53 G 6 Claims



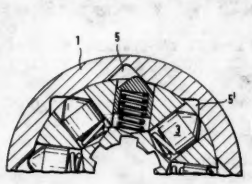
1. A synchronizing mechanism in a gearbox, preferably a vehicle gearbox, including a synchronizing muff (14) rotationally fixed to a shaft (1) and having external engagement teeth (34) coacting with internal engagement teeth (35) on an engagement sleeve (36) surrounding the synchronizing muff (14), this sleeve being axially displaceable for engaging engagement teeth (11) on a first synchronizing ring (7) rotatably mounted on the shaft (1) and unrotatably joined to a gear (6) and formed with a conical friction surface (12) for coaction with a complementary conical friction surface (22) on a second synchronizing ring (21) for synchronizing the rotation of the gear (6) and the shaft (1), the periphery of the synchronizing muff (14) being formed with a number of radial recesses (17) in which radial locating abutments (23) on the second synchronizing ring (21) engage, characterized in that each abutment is formed with a radial hole (24) in which a detent body (25) is displaceably mounted and adapted for being brought by spring means (31,32) into coaction with an interior annular groove (37) in the engagement sleeve (36), the second synchronizing ring (21) being axially centered relative the synchronizing muff (14) by the detent bodies and the spring means (31,32).

4,566,570

OVERLOAD CLUTCH

Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH

Filed Aug. 18, 1983, Ser. No. 524,302
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230817
Int. Cl.⁴ F16D *43/20*
U.S. Cl. 192—56 R 10 Claims



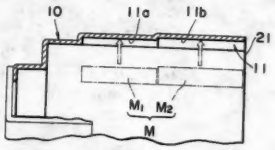
1. An overload clutch particularly for drive lines connecting agricultural implements to a power takeoff shaft of a tractor comprising: a clutch hub; a clutch sleeve; a plurality of recesses in said clutch sleeve; and a plurality of spring-loaded driving members mounted in said clutch hub to engage and disengage said recesses to effect engagement and disengagement of said clutch; said recesses and said driving members being configured to effect disengagement of certain individual ones of said plurality of driving members at different torque transmission levels than remaining driving members of said plurality of driving members.

4,566,571

CLUTCH DRUM OF AUTOMATIC TRANSMISSION

Kazuyoshi Fujioka, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 10, 1984, Ser. No. 578,814
Claims priority, application Japan, Feb. 25, 1983, 58-30557
Int. Cl.⁴ F16D *13/52*
U.S. Cl. 192—70.2 10 Claims



1. In a clutch mechanism of an automatic transmission including an improved clutch drum wherein the improved clutch drum comprises:

a hollow cylindrical member for transmitting rotation to at least one clutch plate having spline projections;

a plurality of spline slots, disposed in said hollow cylindrical member, for engaging the spline projections of the clutch plate, wherein each of the spline slots extends longitudinally from a first slot end to a second slot end, wherein each of the spline slots includes a plurality of longitudinally extending slot portions, wherein the slot portions have varying widths, and wherein the slot portions are arranged in order of increasing width from the first slot end to the second slot end.

4,566,572

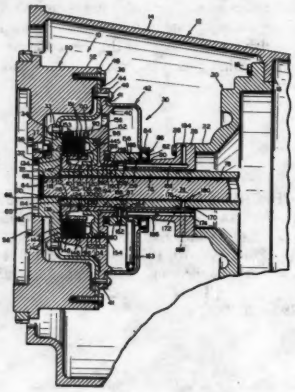
CLUTCH WITH A PILOTED AND SPRING LOADED DRIVEN DISC HUB

Richard A. Flotow, Butler, and William M. Tennant, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jan. 9, 1984, Ser. No. 569,362
Int. Cl.⁴ F16D *25/061, 13/72*
U.S. Cl. 192—70.12 19 Claims

15. In a multiple disc oil cooled and lubricated clutch including a clutch cover, a disc pack disposed within said cover with some members of the pack drivingly connected to said clutch cover and other members of said pack drivingly connected to a driven clutch hub, the latter being adapted for driving connection to a transmission input shaft, means for engaging said disc pack and passage means for conducting fluid into and out of said clutch cover for cooling and lubricating the contents thereof, the improvement comprising a piloting bore formed in said clutch cover adjacent to said clutch hub, the adjacent end of said clutch hub being abuttingly received in said piloting bore and containing radially extending lubricant grooves in the abutting end of said hub, a piloting groove formed in the end of said hub opposite to said abutting end of said hub, and a wave

washer disposed in said piloting groove and compressed between said hub and a portion of said clutch cover axially



spaced from said piloting bore for biasing said hub into piloting engagement with said piloting bore.

4,566,573

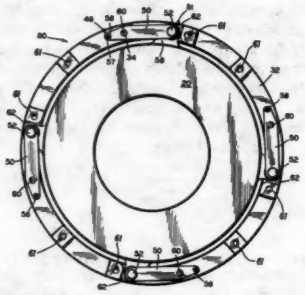
PRESSURE PLATE STRAP DRIVE APPARATUS AND METHOD

Wendell C. Lane, Jr., Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 15, 1982, Ser. No. 449,961

Int. Cl.⁴ F16D *13/44, 13/69, 13/70*

U.S. Cl. 192—70.18 **6 Claims**



1. In a friction plate clutch comprising a cover assembly disposed for mounting to a rotatable flywheel, a pressure plate contained within and axially movable relative to said cover assembly, and a flexible pressure plate strap drive connected to said pressure plate; an improvement wherein said pressure plate strap drive comprises primary and secondary connection means to said cover assembly, both of said connection means comprising direct and positive contacts between said strap drive and said cover assembly, said secondary connection means providing the sole means for insuring concentricity of said pressure plate with respect to said cover assembly, said cover assembly comprising a clutch cover, and an axially extending adapter ring secured thereto, said primary connection means comprising a joint connection of said strap drive to both said adapter ring and cover, and said secondary connection means comprising a separate connection solely to said adapter ring.

4,566,574

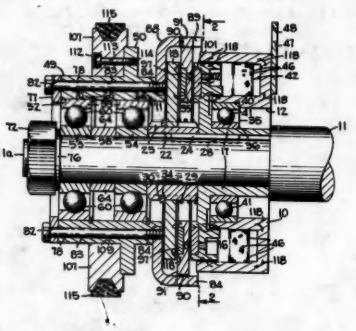
MULTIPLE-DISC ELECTROMAGNETIC CLUTCH

Jeffrey F. Marshall, Waukesha, Wis., assignor to PT Components, Inc., Indianapolis, Ind.

Continuation of Ser. No. 309,370, Oct. 7, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 577,244

Int. Cl.⁴ F16D *27/10*

U.S. Cl. 192—84 C **9 Claims**



1. A magnetic clutch for selectively connecting a rotatable input shaft to a rotatable output hub, said clutch comprising:

a first input disc fixedly mounted on said input shaft for rotation therewith;

a second input disc axially movably mounted on said input shaft for rotation therewith;

an output disc coaxial with said input shaft supported by said output hub for floating axial movement between said first and said second input discs;

outer annular means on said first input disc and said output disc forming first magnetic poles;

inner annular means on said first input disc and said output disc forming second magnetic poles;

annular, rigid insulation means separating said first and said second magnetic poles;

single spring means for biasing said first and said second input discs axially away from said output disc;

connecting means supporting said output disc for rotation with said output hub; and

means for developing a magnetic flux that is directed through said first magnetic poles in said first input disc and said output disc to said second input disc and returns through said second magnetic poles in said output disc and said first input disc, whereby said second input disc and said output disc are drawn towards said fixed first input disc to clamp said output disc between said first and said second input discs so that the torque between said input shaft and said output hub is greatly increased.

4,566,575

SELF-ADJUSTING ELECTROMAGNETIC CONE BRAKE

T. Curran Sekella, Elmira, N.Y., assignor to Facet Enterprises, Inc., Okla.

Filed Dec. 30, 1981, Ser. No. 336,103

Int. Cl.⁴ F16D *13/75, 27/10, 65/52*

U.S. Cl. 192—84 C **20 Claims**

1. An electromagnetic friction device for torque transmission comprising:

input means;

output means coaxially disposed with said input means;

means for translating torque from said input means to said output means, said torque translating means further comprising:

a friction ring member disposed adjacent to said input means;

an inner ring member coaxially disposed with said friction

ring member, said inner ring member further being movable rotatably and axially relative said friction ring member;

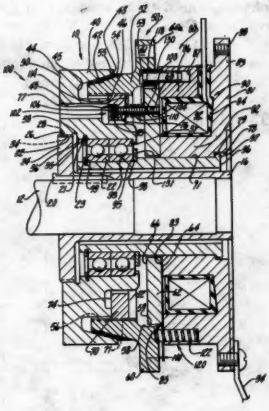
means for electromagnetically biasing said friction ring member out of engagement with said input means, said electromagnetic biasing means being selectively operable and concentrically disposed with respect to said output means to form a partial circuitous flux path therewith, said electromagnetic biasing means comprising

a first magnetic means mounted to said output means;

a second magnetic means mounted to said friction ring member, said first and second magnetic means forming a complete circuitous flux path therebetween;

means for axially adjusting said second magnetic means relative to said friction ring member, said means for axially adjusting further comprising:

means for connecting said inner ring member to said second magnetic means; and



helical biasing means mounted to a portion of said connecting means, said helical biasing means comprising a first radial end portion slidably engaging said friction ring member, a second radial end portion abutting said friction ring member, and a body portion between said first radial and second radial end portion, said body portion further being mounted to said connecting means, whereby said body portion of said helical biasing means biases said inner ring member in an axial direction away from said second magnetic means, said first radial end portions biased said friction ring member to create a predetermined rotational drag between said inner ring member and said friction ring member to prevent over-adjustment and said second radial end portion of said helical biasing means abuts said friction ring member to provide undirectional rotation between said inner ring member and said friction ring member.

4,566,576

REDUCTION GEAR HAVING A MAGNET CLUTCH MECHANISM

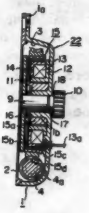
Masaichi Moriya, Chigasaki; Haruo Mochida, and Yoshimitsu Takeda, both of Yokohama, all of Japan, assignors to Ohi Seisakusho Co., Ltd. and Nissan Motor Co., Ltd., both of Yokohama, Japan

Filed Oct. 21, 1982, Ser. No. 435,691

Claims priority, application Japan, Oct. 23, 1981, 56-169717

Int. Cl.[4] F16D *27/10*; F05F *15/12*

U.S. Cl. 192—84 C **4 Claims**



1. A reduction gear mechanism having a magnet clutch mechanism, comprising:

(a) a casing having a front side and a rear side;

(b) an output power shaft supported for rotation on said casing;

(c) an armature mounted to said output power shaft within said casing adjacent said casing rear side;

(d) an annular yoke made of magnetic material having a front side fixed to said casing front side and upper and lower sides extending rearward therefrom towards said casing rear side and defining an opening on the rear side of said yoke;

(e) an annular coil housed within said annular yoke in an opposing relationship to said armature;

(f) a non-magnetic annular member extending between the upper and lower sides of said annular yoke at the rear side of said yoke adjacent to said coil;

(g) a worm wheel which is interposed between said yoke and said armature and is rotatably mounted to said casing, so as to be rotated freely apart from said coil and said armature when the coil is not energized, said worm wheel comprising a cylindrical hub portion, an end wall extending from a rear side end of the hub portion and being interposed between said coil and said armature, a ring portion extending forwardly from an outer circumferential edge of said end wall and an annular toothed member integrally fitted on an outer periphery of the ring portion, wherein said hub portion, end wall and ring portion of said worm wheel define an annular hollow in which said annular yoke is matingly housed; and

(h) a worm which is rotatably mounted to said casing in a meshed relationship with the annular toothed member of said worm wheel, whereby, upon energization of said coil, said armature is magnetically attracted to said worm wheel thereby to connect transmission of rotation of said worm to said armature and said output power shaft.

4,566,577

CLUTCH RELEASE DEVICE FOR MOTORIZED CYCLES

Masaharu Tsuboi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,519

Claims priority, application Japan, Jan. 8, 1982, 57-1417

Int. Cl.[4] F16D *25/08*

U.S. Cl. 192—85 CA **4 Claims**

1. A clutch release device for a motorized cycle including an engine, at least one rear wheel, transmission means for transmitting the power of said engine to said rear wheel, and said

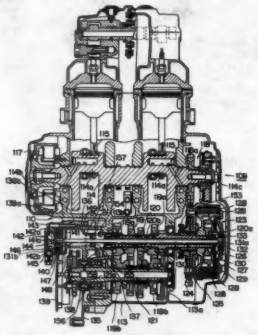
transmission means comprising a friction clutch mechanism connected with said engine, a sprocket for chain-driving said rear wheel, a speed change mechanism of a gearing type having a tubular main shaft connected with said clutch mechanism and a counter shaft connected to said sprocket, said main shaft and said counter shaft being arranged to be substantially parallel with each other, and said clutch mechanism and said sprocket being disposed on either end side of said main shaft and on the opposite end side of said counter shaft, respectively, comprising:

a push rod member arranged for advancing and retreating movement through said main shaft;

said push rod member having either end portion thereof adapted to release said clutch mechanism as said push rod member advances or retreats;

a hydraulic cylinder acting on the other end portion of said rod member, thereby causing same to advance or retreat;

said hydraulic cylinder being disposed more remote from the axial center line of said motorized cycle than said sprocket;



said power transmission means having a chain cover member covering the outside of said sprocket;

said hydraulic cylinder being supported by said chain cover member;

said speed change mechanism having a transmission case member bearing respective both end portions of said main shaft and said counter shaft;

said chain cover member being disposed so as to be spaced from said transmission case member with a spacer member sandwiched therebetween;

said spacer member comprising a chain guide substantially covering the inside of said sprocket;

said chain guide having a tubular portion;

said push rod member having an extended end portion extending through said tubular portion to outside of said chain guide member; and

said hydraulic cylinder being arranged to act on the distal end of said extended end portion.

4,566,578

CLUTCH THROW-OUT BEARING AND BEARING CARRIER ASSEMBLY

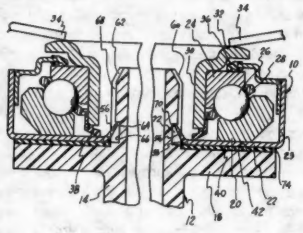
Keith V. Leigh-Monstevens, Troy, and David L. Wrobleski, Fraser, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Jun. 4, 1984, Ser. No. 616,713

Int. Cl.[4] F16D *19/00*

U.S. Cl. 192—98 **18 Claims**

1. A clutch release bearing and bearing carrier assembly comprising a carrier member in the form of a tubular sleeve member, a radial flange proximate an end of said tubular sleeve member, and a bearing member having a housing rear wall supporting a race of said bearing member, said housing rear wall having a radially and angularly projecting lug, said sleeve body member having a frusto-conical end portion for elastically deflecting said lug when said bearing member is pressed onto the end of said sleeve body member, and a pocket formed



in the peripheral surface of said sleeve body member having an abutment for engagement by said lug when said bearing housing rear wall engages said flange.

4,566,579

MULTIPLE BISCUIT CLUTCH OR BRAKE WITH CIRCULATED IMMERSION COOLING

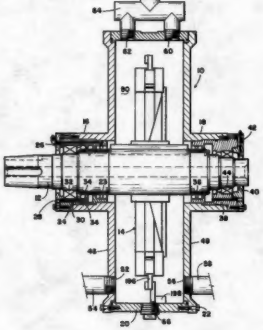
Earl R. Johnson, Tulsa, Okla., assignor to Loffland Brothers Company, Tulsa, Okla.

Filed May 29, 1984, Ser. No. 614,999

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.[4] F16D *13/72, 25/063*

U.S. Cl. 192—113 B **8 Claims**



1. A friction apparatus adapted for installation on a rotatable shaft and comprising hub means concentrically disposed around the shaft and secured thereto for rotation simultaneously therewith, a rotatable annular disc means concentrically disposed around the shaft and adapted for connection with the shaft for selected simultaneous rotation therebetween, a pair of annular flanges disposed outboard of the disc means and spaced slightly from the opposite sides thereof, piston means carried by the disc means and operable between extended and retracted positions between the annular flanges for alternate frictional engagement and disengagement with respect thereto, means secured to the annular flanges for supporting thereof independent of the disc means whereby the disc and annular flanges coact simultaneously in the frictional engaged position of the piston means and act independently in the disengaged position of the piston means, fluid chamber means disposed around the disc means and pistons and flanges for receiving and circulating a coolant therearound for dissipation

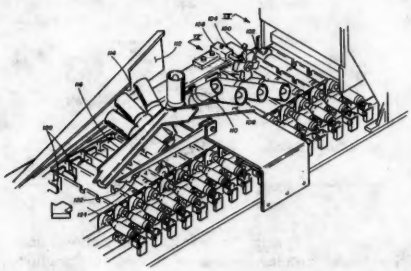
of heat created by the frictional engagement between the piston means and annular flanges.

4,566,580

AMMUNITION REORIENTING PROCESS

Anthony J. Aloi, Richmond; George D. Brooks, So. Burlington, and Ronald E. Prince, Colchester, all of Vt., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 336,791, Jan. 4, 1982, Pat. No. 4,434,700.
This application Dec. 23, 1983, Ser. No. 564,861
Int. Cl.[4] F42B *39/10;* B65B *35/56*
U.S. Cl. 193—48 1 Claim



1. A process of sorting a plurality of fixed cased rounds of ammunition, contained in a receptacle in non-uniform end to end orientation, each round having a center of gravity which is spaced a first distance from a first end thereof, and a second distance from the second end thereof the first distance being greater than the second distance, comprising:

discharging the rounds sequentially into a train of such rounds flowing along a first surface downstream with each round lying transverse to the direction of flow in either of a first or second end to end orientation;

passing each round in the train over a recess so that a round in said first orientation has its respective center of gravity over said recess and the second end of said round tilts downwardly into said recess while a round in said second orientation has its respective center of gravity over said first surface and does not tilt;

providing the end, which passes over the recess, of each round of ammunition as it commences passing over the recess with an initial positive limited displacement into said recess whereby rounds in said first orientation continue to tilt into the recess, while rounds in said second orientation restore themselves to an untilted disposition;

shifting the angle of tilt beyond the perpendicular of any tilted round to change its orientation from said first orientation to said second orientation and restoring any tilted round back to said first surface so that all rounds in the train are in the second orientation.

4,566,581

COIN OPERATED DISPENSERS FOR DISPENSING HORIZONTALLY DISPOSED ARTICLES SUCH AS NEWSPAPERS FROM THE UPPER END OF A STACK

Dennis R. Martin, Saginaw, Mich., assignor to Draper Technologies, Inc., Saginaw, Mich.

Filed Sep. 15, 1983, Ser. No. 532,380
Int. Cl.[4] G07F *11/22*
U.S. Cl. 194—248 15 Claims

15. In a coin operated newspaper and like article vending machine for dispensing articles on a one-at-a-time basis:

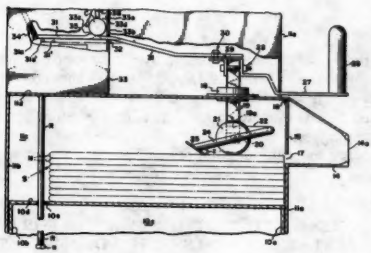
a. a housing forming a cabinet for containing a vertical stack of horizontally disposed newspapers having front, rear and side edges, and like articles to be vended;

b. wall means incorporated with the housing providing a dispensing slot for passing one article at a time laterally out from the top of said stack;

c. means for supporting successive articles in the stack in a broadside position with their front edges facing the dispensing slot;

d. dispensing elements actuable to engage the uppermost article in the stack and move one side edge of the topmost article at least partly out the opening comprising a fulcrum shoe mounted to rotate about its own generally vertical axis of rotation and having a projecting arm mounted for swinging travel about said axis in generally a horizontal plane;

e. generally vertical pivot means providing said generally vertical axis, mounted on said housing inward of said slot above a corner portion of said support means and the articles supported thereon, and supporting the fulcrum shoe for rotation about said axis;



f. a curvilinear fulcrum surface on the lower end of said shoe depending to engage the topmost newspaper on said platform at a corner thereof;

g. an article edge-engaging claw mounted by said arm at a spaced distance inwardly from said axis and fulcrum surface for movement in sliding engagement with the topmost article and for vertical downward movement when it has cleared the topmost article in its return travel to a position facing an edge of the article;

h. operating linkage operable to swing said arm substantially about the fulcrum surface and turn said claw to turn a topmost article disposed broadside on said support means to generally an endwise position projecting out said slot; and

i. coin controlled latch means normally preventing operation of said linkage except when proper coins are inserted.

4,566,582

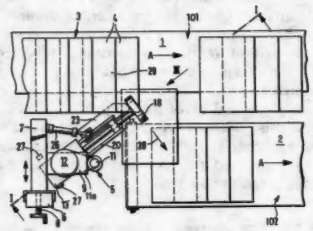
APPARATUS FOR CHANGING THE DIRECTION OF ADVANCEMENT OF A STREAM OF PAPER SHEETS OR THE LIKE

Heinz Linder, Zofingen, Switzerland, assignor to Grapha-Holding Aktiengesellschaft, Hergiswil, Switzerland

Filed Oct. 26, 1983, Ser. No. 545,657
Claims priority, application Switzerland, Nov. 2, 1982, 6363/82
Int. Cl.[4] B65H *29/60*
U.S. Cl. 198—367 14 Claims

1. Apparatus for diverting flat objects of a stream of such objects, particularly selected sheets of a stream of partially overlapping sheets, comprising first conveyor means defining a substantially horizontal first path and arranged to normally advance the stream along such first path in a predetermined direction; second conveyor means defining a substantially horizontal second path having a portion adjacent to a portion of said first path, said first and second paths being essentially coplanar and being adjacent and substantially parallel to each other; and means for diverting objects from said portion of said first path into said portion of said second path, including a pair of rotary elements disposed at a level above said first path,

defining a nip and being movable to and from operative positions adjacent to said portion of said first path about an axis which is substantially normal to the plane of said portion of said first path, a deflecting member disposed at a level above said first path and upstream of said rotary elements, as considered in said direction, and movable between a first position remote from the objects in said first path and a second position in which said deflecting member extends into said first path and directs the oncoming objects into said nip, and means for rotating said rotary elements in directions to advance the objects entering said nip into said portion of said second path.



4,566,583

VESSEL SEPARATING APPARATUS FOR USE IN PARTICULAR IN VESSEL HANDLING MACHINES

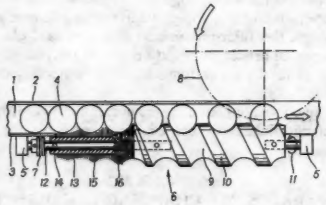
Egon Schneider, Neutraubling, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder, Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Continuation of Ser. No. 407,181, Aug. 11, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 710,537

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3132048

Int. Cl.[4] B65G 47/26

U.S. Cl. 198—459 7 Claims



1. A vessel separating apparatus for use in particular in vessel handling machines, comprising:

a conveyor belt;

a lateral guide means along one side of said conveyor belt and a worm conveyor along an opposite side of said conveyor belt;

said worm conveyor being provided at least in the entrance region thereof with a rigid core having a resilient jacket thereon consisting only of a plurality of radially extending, resiliently flexible bristles, the inner ends of which are secured to said core, the outer ends of which are formed to a worm conveyor thread, the flights of which are adapted to enter between said vessels to effect a conveyance of said vessels in response to a rotation of at least said entrance region of said worm conveyor, all of said radially extending flexible bristles being made of the same flexible material so that the radially outermost ends of said bristles forming said worm conveyor thread are capable of yielding in the event that one of said vessels is temporarily wedged between said worm conveyor thread and said laterial guide means.

4,566,584

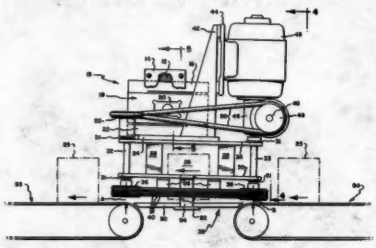
WEIGHING CONVEYOR

John W. Lindstrom, Newfield, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Oct. 29, 1984, Ser. No. 666,209

Int. Cl.[4] G01G 11/00

U.S. Cl. 198—504 17 Claims



1. A machine system for transporting and weighing or checkweighing articles passing in succession therethrough, such as for use in conjunction with weight-signal transmitting-/converting/calculating printout devices or the like for visual display and price labeling operations or the like; said system comprising in combination:

article delivery and take-away means;

a weighing machine support device;

a weighing machine including a vertically flexible weight-measuring means attached to and suspended from said support device;

a truss type structure of inverted U-shaped sectional form attached to and suspended from said weight-measuring means and having oppositely disposed side wall portions thereof defining in aligned combination with said article delivery and take-away means an article-to-be-weighed passageway through said machine system;

oppositely paired article transport means carried upon said truss structure at opposite in-board side wall portions thereof for carrying therebetween articles to be weighed in vertically suspended succession through said passageway; and

means powering said article transport means mounted upon said truss structure comprising a tare weight component of said weighing machine.

4,566,585

SELF-CENTERING DRIVER FOR OBLONG MATERIAL

Ulrich Dreher, Trochtelfingen, and Helmut Reitz, Metzingen, both of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Förster, Reutlingen, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,364

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3222104

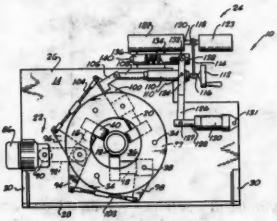
Int. Cl.[4] B65G 29/00

U.S. Cl. 198—624 9 Claims

1. Driver for self-centering driver of oblong-shaped semifinished material of a cylindrical or polygonal cross section, said drive being in longitudinal direction of the material along a track, including a mounting body having a passage for the material being driven along the track, at least three arms attached to the mounting body, at the nearest part of the arms to the material one rotation element each is arranged, at least one of said rotation elements being driven and in driving contact with the material, and means for simultaneous and uniform adjustment of the three arms relative to the material, comprising:

the arms are swingable about an axis in a plane vertical to the track of the material and the rotary movement for the driven rotation elements is provided by a shaft coaxial with the swing axis and is transferred to the rotation elements via a miter gear attached to the arms;

said arms including lever projections facing away from the semifinished material, said projections being connected to each other by bar structures for enabling common adjustment and setting of the arms;



motor-driven adjustment means connected to one of said arms for a common adjustment and setting of the arms; and

a drive engaging, on one hand, one of the lever projections and on the other hand a lever, which lever is pivoted directly at the mounting body and is pressed by a spring arrangement towards a stc ρ in a sense setting the rotation elements.

4,566,586

PRESSURE DEVICE FOR CONVEYOR

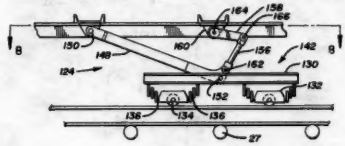
Tommie E. Robertson, Guin, Ala., assignor to The Continental Conveyor & Equipment Co., Inc., Winfield, Ala.

Filed Aug. 17, 1983, Ser. No. 524,057

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ B65G *15/14*

U.S. Cl. 198—628 **3 Claims**



1. For use in a high angle conveying apparatus having a conveyor belt and a cover belt trained for movement in endless configurations through a lifting zone whereat said belts are moved into operative association with each other so that material on said conveyor belt will be held in contact therewith by said cover belt, improved pressure means for applying essentially fully equalized pressure to the back surface of said cover belt including:

(a) a module of rollers,

(b) at least one row of rollers mounted within said module, each row of rollers positioned to contact the back surface of the cover belt along a line transverse to the direction of movement of the cover belt, each said row of rollers comprising a plurality of freely rotatable individual rollers contacting the cover belt across the major extent of the line across the cover belt, with each roller being on an individually moveable axis of rotation to permit conformance of each roller to the cover belt independent of its adjacent roller,

(c) support means pivotally coupled at a first end to a framing member of the conveying apparatus and at a second end to said module of rollers for movement of the module as a whole relative to said framing member,

(d) a torsion spring means between said framing member and said support means at said second end to bias each said row of rollers into contact with the back surface of the cover belt for applying essentially fully equalized pressure thereto, and

(e) said torsion spring means including a torsion spring mounted on said framing member at a position adjacent the module of rollers, an upper link member connected to said torsion spring for rotation about an axis to transfer torsion from said spring, a lower link member pivotally connected to said upper link member and to said support means for transferring torsion from said upper link member to said support means.

4,566,587

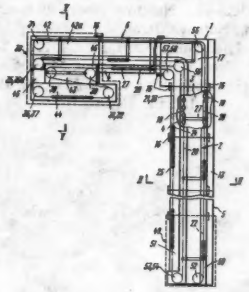
ANGLE SCRAPER CHAIN FACE CONVEYOR

Viktor M. Gorlov, Donetsk; Evgeny I. Kiselev, Kopeisk; Alexandr G. Levin; Valentin I. Kutovoi, both of Donetsk; Jury F. Tverezy, Kopeisk, and Igor V. Spivak, Donetsk, all of U.S.S.R., assignors to Donetsky Nauchno-Issledovatelsky Ugolny Institut, Donetsk, U.S.S.R.

Filed Jun. 24, 1982, Ser. No. 391,680

Int. Cl.⁴ B65G *19/26*

U.S. Cl. 198—732 **7 Claims**



1. An angle scraper chain face conveyor comprising: a pan line which includes pans that couple one another in a separable fashion and form a conveying channel and a return channel; a face part of said pan line; a gate part of said pan line; an angle section adapted to couple in a separable fashion said face part with said gate part and having attachment elements adapted to couple it with said face part and said gate part which attachment elements permit the installation of said face part in place of said gate part in the process of assembling the conveyor in an opposite mine face; two chain assemblies closed horizontally, each of said chain assemblies having a conveying run situated in said conveying channel of said pan line and a return run situated in said return channel of said pan line; means for driving said chain assemblies along said pan line; flights implemented in the form of two parts which are joint-coupled with each other and with said chain assemblies; a drive section provided with drive and deflector pulleys for said chain assemblies and coupled with an end of said gate part which is most distant with respect to said face part; drive pulleys of said drive section coupled kinematically with said drive means; said drive section having three parts which couple with one another in a separable fashion, including a first part of said three parts of said drive section adapted to mount respective deflector pulleys and having a portion whose shape is the same as that of said conveying channel of said pan line, the first part of said drive section being located adjacent to said conveying channel; said first part of said drive section having attachment means for releasably coupling said first part with said gate part and said

face part; a second part of said drive section adapted to mount respective deflector pulleys and having a portion whose shape is the same as that of said return channel, said second part being situated adjacent to said return channel and between said first part and a third part of said drive section; a third part of said drive section adapted to mount respective drive and deflector pulleys; said second and third parts of said drive section each having an axis of symmetry that is parallel with the geometric longitudinal axis of said gate part; a tail section having deflector pulleys for said chain assemblies and coupled with that end of said face part which is most distant with respect to said gate part; said tail section having two parts which are coupled together in a separable fashion, a first part of said two parts of said tail section adpated to mount deflector pulleys and implemented as a mirror reflection of said first part of said three parts of said drive section and situated adjacent to said conveying channel of said pan line; said first part of said tail section having attachment means for releasably coupling said first part of said tail section with said gate part and said face part; and a second part of said tail section whose shape is the same as that of the return channel of said pan line, said second part being located adjacent to said return channel.

4,566,588

AMMUNITION STORAGE SYSTEM AND CONTAINER FOR USE THEREIN

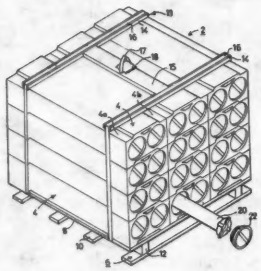
Nachman Katsczynski, Natanya, Israel, assignor to Urdan Industries Ltd., Natanya, Israel

Continuation of Ser. No. 356,356, Mar. 9, 1982. This application Nov. 2, 1983, Ser. No. 548,036

Claims priority, application Israel, Mar. 20, 1981, 62441

Int. Cl.[4] F42B *37/00*

U.S. Cl. 206—3 **14 Claims**



1. An ammunition storage system including a supporting pallet, a plurality of like containers in stacked relationship on said supporting pallet and arranged in a plurality of vertical columns and horizontal rows to form a multi-layer honeycomb construction, each container having at least one internal compartment configured to receive a round of ammunition, the lower face of each container being formed with a foot at each end, and the upper face of each container being formed with a socket at each end of a configuration to nestably receive the foot of another like container and to prevent both sidewise and longitudinal movements therebetween, and a strap applied circumferentially around an intermediate portion of said containers and supporting pallet to secure them in said honeycomb construction, thereby facilitating: the transportation to the vehicle of the plurality of rounds of ammunition, their storage within the vehicle in a condition providing a high degree of mechanical protection because of the cushioning effect of the honeycomb construction, and the individual use of the ammunition rounds by their individual removal from one end of their respective containers in the honeycomb construction.

4,566,589

GAS CONTAINER

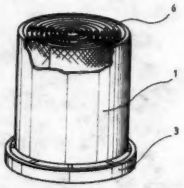
Udo Poschinger, Neu Esting, Palsweiser Strasse 3n, D-8037 Olching, Fed. Rep. of Germany

Filed Feb. 28, 1984, Ser. No. 584,328

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307797; Jun. 22, 1983, 3322328

Int. Cl.[4] F17C *13/12*

U.S. Cl. 206—0.6 **7 Claims**



1. A cylindrical container for liquid gas comprising walls including a main cylindrical wall portion, wherein said walls enclose said container and are formed of an aluminum alloy and a heat-conductive filler inlay arranged within said cylindrical container, said heat-conductive filler inlay being formed of a three-dimensional metallic grid structure of a cylindrical shape formed of at least two coils of expanded metal nested within each other, wherein said expanded metal is made of an aluminum foil having a thickness within the range of about 0.02 mm to 0.1 mm.

4,566,590

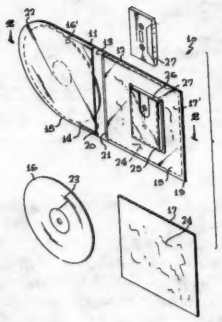
RECORDED AND PRINTED MESSAGE CARRIER

Larry F. Manning, 4706 Kester, Sherman Oaks, Calif. 91403, and Andrea Stanley, 409 Winchester Ave., Glendale, Calif. 91201

Filed Sep. 6, 1984, Ser. No. 648,000

Int. Cl.[4] B65D *85/57, 85/62, 85/672*

U.S. Cl. 206—232 **1 Claim**



1. A recorded and printed message carrier comprising:

a record medium having audio recorded data carried thereon;

a printed message medium having visible indicia carried thereon;

an elongated backing sheet of pliable, transparent material having a hinge portion mid-way between the opposite ends constituting a hinge for folding said backing sheet over upon itself;

a first and a second front sheet of material attached to the edge marginal regions adjacent to the peripheral edge of said backing sheet;

said front sheets having exterior outer edges corresponding

to and following said backing sheet at its opposite ends and separated from each other by said hinge portion so as to constitute a pair of open pockets for insertably receiving said record medium and said printed message medium respectively;

said record medium disposed in one of said pair of open pockets and said printed message medium disposed in said other open pocket of said pair;

said first and second sheets include unattached opposing edges in spaced apart parallel relationship separated by said hinge portion which constitutes entrances leading into each of said respective pockets;

said first and second sheets are composed of transparent material for visually exposing said record and printed message mediums therethrough;

said record medium is a circular disk having pictorial indicia carried thereon and said printed message medium is square cornered;

each of said backing sheet ends and corresponding front sheets defining said pockets is configured to conform to the external circular shape of said record medium and said square cornered printed message medium respectively;

said backing sheet carrying said pocket insertably receiving said circular record medium is substantially longer in length than said pocket insertably receiving said square cornered record medium;

a third front sheet of material attached along its edge marginal regions to a selected one of said first and second front sheets and having an opening normal to said first and second sheets opposing edges and to said hinge portion for insertably receiving a recorded medium taking the form of a magnetic tape cassette;

said tape cassette having a thickness substantially greater than the thickness of said disk record medium and said printed message medium;

said third sheet constituting a third pocket having its opening in alignment normal to said opening of said pocket sheet on which it is carried;

said backing sheet is composed of a transparent material visually exposing the sides of said record and printed message mediums opposite to their sides visually exposed through said front sheets;

said hinge portion is of a width at least equal to the thickness of said first mentioned pocket and said third pocket so as to accommodate said medium thicknesses when folded over upon themselves; and

a plurality of scorelines carried laterally across said hinge portion defining pivotal axis for rotating said backing sheet.

4,566,591

MULTIPLE PACKAGING DEVICE

Alfons Turtschan, Schwaebisch Hall, and Herbert Drechsler, Vellberg, both of Fed. Rep. of Germany, assignors to Gasti-Verpackungsmachinen GmbH, Schwaebisch Hall, Fed. Rep. of Germany

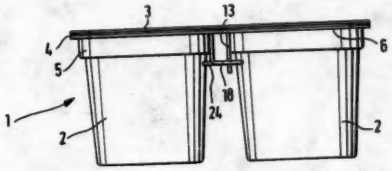
Filed Aug. 27, 1984, Ser. No. 644,779

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330777

Int. Cl.⁴ B65D *75/00*

U.S. Cl. 206—427 **10 Claims**

1. A multiple packaging system for containers which have edge flanges and are closable with covers, wherein containers are held together by a connecting element which grips the containers, said connecting element comprising a flat cut-out which supports the edge flanges of the containers from the underside and is firmly connected to the covers of the containers, wherein the covers comprise a cover sheet which is sealable to the containers and is attached to the containers, and the length and width of the cover sheet have the same dimensions as those of the cut-out and the containers are of tubular configuration and the cut-out and the cover sheet are attached to each other in the corners on the sides of the containers.



4,566,592

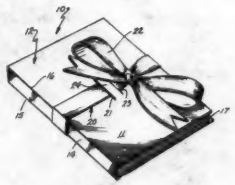
DECORATIVE PACKAGE

Colette M. Klukos, 10030 - 152nd St., West Olive, Mich. 49460

Filed Oct. 3, 1984, Ser. No. 657,181

Int. Cl.⁴ B65D *85/62*

U.S. Cl. 206—449 **9 Claims**



1. A decorative package for planar objects such as cards comprising:

a first panel and a second panel joined along an adjacent edge of each panel to define a pocket between said panels, said first panel having joined edge joined to said second panel and a free edge opposite said joined edge;

binding means surrounding said panels in a direction orthogonal to said edges for holding the panels together and confining objects placed in the pocket, said binding means including an elongated binding element having two ends, said two ends tied in a decorative bow adjacent said first panel; and

said first panel including two spaced apertures therethrough said apertures defining tab means therebetween, said binding element extending under said tab means, and said decorative bow being disposed between said free edge and said apertures and adjacent said apertures.

4,566,593

CARTON FORMED FROM A PLURALITY OF PACKAGES

Rolf Muller, Mehring, Fed. Rep. of Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 23, 1985, Ser. No. 693,713

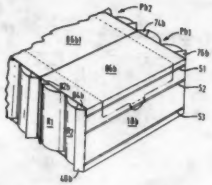
Claims priority, application United Kingdom, Jan. 23, 1984, 8401658

Int. Cl.⁴ B65D *5/54*

U.S. Cl. 206—611 **6 Claims**

1. A unitized shipping and display carton comprising a plurality of packages each having a top wall and a base interconnected by a pair of spaced side walls so as to form a tubular structure, end wall means to prevent endwise movement of the contents through the ends of said tubular structure, a removable opening panel provided in each top wall and extending at least partially in at least one of said side walls and defined by tear lines, characterised in that said packages are joined one to

the next in side-by-side relationship at least along the side wall portions of said opening panels and in that said tear lines defining the top wall portion of the opening panel of one package



are in registry with those of the next adjacent package whereby removal of the opening panel of an endmost package of said carton can be continued to cause removal of the opening panels of the other packages in said carton.

4,566,594

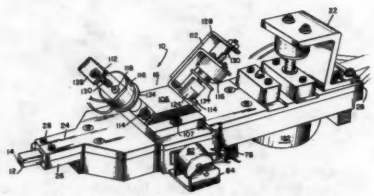
COMPONENT VERIFIER

Leon F. Sleger, Wakefield, and Robert D. DiNozzi, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 451,917, Dec. 27, 1982, abandoned. This application Jan. 8, 1985, Ser. No. 689,507

Int. Cl.[4] B07C *5/02*

U.S. Cl. 209—539 **11 Claims**



1. A verifier operable in response to a computer control for testing the acceptability of a chip type component passing down an enclosed air track conveyor having a passageway in which the component is transported, comprising:

(a.) means positioned exterior of the conveyor and insertable into the passageway for arresting the travel of the component in the conveyor;

(b.) means mounted exterior of the conveyor and including means extending into the conveyor passageway for electrically contacting the electrical contacts on the component to test whether the proper component is present and whether the electrical value is acceptable;

(c.) means for releasing said arresting means and said electrical contacting means to permit the component to pass down the conveyor; and

(d.) means downstream from the verifier including a rotary switch having a slot in communication with the conveyor passageway when a component tests acceptable and an inclined rejection slot in communication with the conveyor passageway for rejecting the component if it is unacceptable.

4,566,595

DEVICE FOR CLASSIFYING HANDLED OBJECTS

Guy Fustier, 5, rue de Reims, 94230 Cachan, France

Filed Apr. 8, 1983, Ser. No. 483,170

Claims priority, application France, Apr. 15, 1982, 82 06480

Int. Cl.[4] B07C *1/18, 3/18*

U.S. Cl. 209—545 **4 Claims**

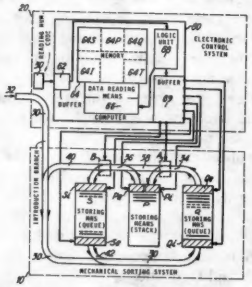
1. A device for classifying objects, wherein it comprises a mechanical classification system and an electronic control system, the classification system comprising:

(A) a first means for the storage of objects, organised in the form of a queue, i.e. enabling the objects to be removed in the order in which they entered, said means being provided for this purpose with a member for introducing the objects into the queue and a member for extracting the first object from the queue;

(B) a second means for the storage of objects, organised in the form of a stack, i.e. enabling the objects to be removed in the opposite order from that in which they were inserted, said means being consequently provided with a member for introducing objects to the stack and member for extracting the first object from the stack;

(C) a third means for storing objects, organised in a queue, i.e. able to remove the objects in the order in which they entered, said means being provided for this purpose with a member for introducing the objects into the queue and a member for extracting the first object from the queue;

(D) means for conveying the objects to be classified, comprising an introduction branch located between an intake and the introduction member in the first storage means, a branch between the extraction member of the first means and the introduction member of the second storage means, said branch having first switching means, a branch between the extraction member of the second storage means and the introduction member of the third storage means,



said branch having a second switching means, a branch between the first switching means and the second switching means, a branch between the second switching means and the introduction branch, a branch between the extraction member of the third storage means and the introduction branch, and wherein the electronic control system comprises:

(E) means for reading a numerical code on the object passing on the introduction branch,

(F) a control computer comprising:

(a) a buffer input circuit connected to the reading means

(b) a memory able to receive the codes of the different objects introduced into the classification system, said memory comprising a first zone operating in a queue in accordance with the first-in-first-out procedure, a second zone operating in a stack according to the last-in-first-out procedure, a third zone functioning as a queue, a fourth memory zone in which is stored information indicating whether there is an inversion of each code with respect to the code immediately following and a fifth zone comprising instructions, the stored codes being arranged in the first, second and third memory zones in the same way as the processed objects are respectively arranged in the first, second and third storage means;

(c) a circuit for reading the data and instructions stored in the memory;

(d) a logic unit performing instructions and able to control

the transfer of codes from one memory zone to another in order to classify the codes in a given order in the first memory zone and for supplying control instructions able to displace the objects corresponding to said codes from one storage means to another in order to finally obtain, in the first storage means, the objects classified in the desired order;

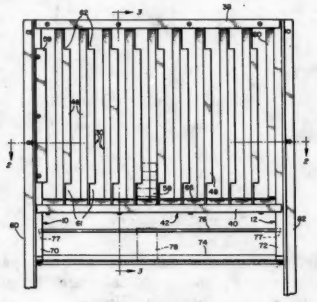
(e) an output buffer circuit connected to the logic unit and having 8 outputs connected to the introduction members, to the extraction members and to the two switching means.

4,566,596

KNOCK-DOWN DISPENSER PACK FOR STACKED ARTICLES

Kurt C. Hennig, 2 Arlie Dr., Annapolis, Md. 21401

Filed Mar. 9, 1984, Ser. No. 587,912
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—59.2 **10 Claims**



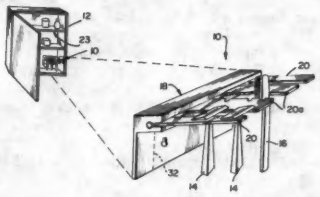
1. A knock-down rack for dispensing articles stacked in side-by-side vertical rows in said rack comprising a pair of end panels and top and bottom panels adapted to be connected in horizontal relationship to said end panels, said top and bottom panels having horizontal parallel side edges, a plurality of slots in the side edges of said top and bottom panels normal to said side edges, the spacing between any two adjacent slots being the same in each edge of both of said panels whereby when said horizontal panels are assembled to said end panels all of the slots in one side edge of a panel align horizontally with the slots in the other side edge of said panel and also align vertically with the slots in the side edges of the other of said panels, a plurality of front and rear retainer members each having end parts for reception in a pair of vertically aligned slots in the respective panels, strips engageable with the respective side edges of said horizontal panels for loosely trapping the end parts of at least the front retainer members within said slots, means for assembling together said top, bottom and end panels, and means for assembling said strips to said panels over said slots following insertion of said end parts of at least said front retainer members into said slots, said retainer members being channels having side walls at right angles to each other, the end parts for reception in said slots being one of said side walls, each of said front retainer members when assembled on one side of said rack having its other side wall facing in one direction parallel to the side edges of the top and bottom panels, each of said rear retainer members when assembled on the other side of said rack having its other side wall facing in the opposite direction parallel to the side edges of the top and bottom panels whereby the side walls of a retainer member on one side of the rack defines with the side walls of a diagonally disposed retainer on the other side of the rack a rectangular open sided vertical chute corresponding to the cross section of articles stacked in said chute.

4,566,597

MODULAR SUPPORT UNIT

Mario A. Caputo, 4905 Avenue "M", and Jeffrey C. Caputo, 4903 Avenue "M", both of Brooklyn, N.Y. 11234

Filed Aug. 8, 1983, Ser. No. 521,159
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—87 **6 Claims**



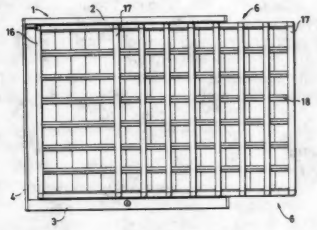
1. A modular support unit for stackable storage of safety razors and other personal articles comprising a base member having a backplate attachable to a substantially vertical surface, a flange portion extending from said backplate, said flange portion defining a channel coextensive therewith and having at least one open end, said channel further defining a recess therein, a plurality of interchangeable modular support arms having attachment means along a transverse edge, said support arms being substantially planar and slidably positionable within said channel through an open end, said attachment means interfitting within the recess for securing the support arm with the support arm projecting from the channel and being downwardly inclined toward the backplate, said support arms further defining an article receiving slot between a pair of confronting longitudinal edges, said slot having a width dimension being variably adjustable by substantially parallel slidable positioning of the support arms within the channel, said slot further having a length dimension adaptable for accepting a plurality of articles, with said articles being storable in gravity-assisted stacked relationship, said longitudinal confronting edges of the slot defining a plurality of complementary notch means for providing additional width dimension along the length of the slot for adjustable positioning of said articles within the slot.

4,566,598

ARRANGEMENT IN DISPLAY AND STORAGE RACKS

Henry Fors, Sundbyberg, Sweden, assignor to Forss Union AB, Sweden

Filed Aug. 26, 1983, Ser. No. 526,650
Claims priority, application Sweden, Aug. 27, 1982, 8204913
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—96 **6 Claims**



1. Arrangement in display and storage racks with swingable frames, particularly for easily stolen and difficulty displayed articles, a frame including at least one shelf space having a depth and a free height closely compatible with the extension in depth and height of an article (A) and defined laterally by

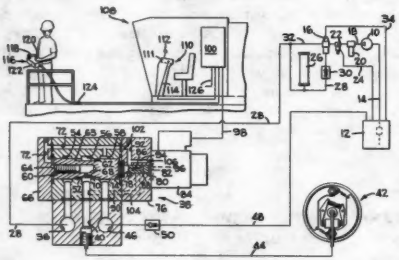
two side members (16, 17) and vertically by a top member (14;18) and bottom member (15; 18), said defining members (14–18) having means (19–22) for preventing removal of the article (A) from the shelf space, characterized in that the means for preventing removal of the article (A) from the shelf space comprise projections (19–20) from the opposing surfaces of the top and bottom members extending in the area of the top and bottom portions of the article and a distance along the front and rear sides of the article, at least one (22) of said projections (19–22) is movable vertically from a position in which a portion, or the whole, of its length engages against the front or rear side of the article (A) and prevents its removal from the shelf space, and to a position in which substantially the whole of its length is away from the vertical extension of the article (A) such that the article (A) placed in the shelf space is removable therefrom by tipping out the top or bottom portion of said article (A); the side, top and bottom members (14–18) comprising hollow sections joined at their corner portions with corner fittings (24) in a manner known per se to form a frame (6), each top member (14;18) including the projections (19, 20), forming a U-shape with the opening downwards, and each bottom member (15;18) including two members (21, 22) of L-shaped cross section with one leg vertical, one of said L-shaped members (22) being vertically movable.

4,566,599

TELECONTROL SYSTEM FOR CRANES

Ferruccio Villa, Turate, and Fabio Castelli, Sesto San Giovanni, both of Italy, assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 4, 1983, Ser. No. 520,261
Claims priority, application Italy, Sep. 9, 1982, 23184 A/82
Int. Cl.⁴ B66C *13/40*
U.S. Cl. 212—160 **3 Claims**



1. In a crane having a swingable upper works including a cab, a rotating joint and a pressure actuated clutch for controlling a crane function, the improvement comprising;

a cab control panel mounted in said cab and including a cab control lever moveable to provide a cab control input;

a cab encoder in said cab control panel for producing a cab output signal related to said control input;

a lightweight portable control panel including a remote control lever moveable to provide a remote control input;

a remote encoder in said portable control panel for producing a remote output signal related to said remote control input;

an umbilical cord connecting said remote encoder in said rotating joint;

an operational amplifier;

a switch for selectively connecting said amplifier to one of said rotating joint and said cab encoder;

a decoder connected to receive the output from said amplifier;

a variable current source means connected to said decoder and producing a current flow related to the selected one of said control input;

a solenoid means connected to said source means and producing a solenoid force related to current;

a hydraulic valve means operatively connected to said solenoid means for modulating pressure to said clutch as a function of said solenoid force; and

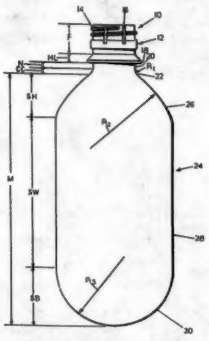
both said cab and said remote encorders producing redundant output signals and said operational amplifier selects the output signal with less noise to amplify.

4,566,600

PLASTIC CONTAINER

Long F. Chang, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 628,014, Jul. 5, 1984, abandoned. This application Mar. 12, 1985, Ser. No. 710,825
Int. Cl.⁴ B65D *23/00*
U.S. Cl. 215—1 C **11 Claims**



1. A hollow oriented container formed from a parison composed of an organic, thermoplastic, strain hardenable polymeric resin, said container comprising:

a finish portion;

a finish ledge portion integral with and disposed below said finish portion;

a generally cylindrical hollow neck portion integral with and disposed below said finish ledge portion;

a concave blending portion integral with and disposed below said neck portion; and

an oriented main body portion including a closed bottom portion integral with and disposed below said concave blending portion wherein said concave blending portion is less than five percent of the container surface area, the container being defined by the following relationship:

$$E \geq 0.9$$

wherein:

$$E = \frac{S/(W)}{\int \frac{1}{W}\, da}$$

S=the container surface area

(W)=average wall thickness of the container excluding the finish portion and ledge portion.

4,566,601

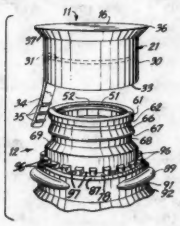
TAMPERPROOF CONTAINER NECK CONSTRUCTION

Ernest O. Kuenzig, 32 Waverly St., Glen Head, N.Y. 11545

Filed Aug. 13, 1984, Ser. No. 640,341
Int. Cl.⁴ B65D *41/48*
U.S. Cl. 215—31 **13 Claims**

1. A container construction for engagement with a snap-on cap having a skirt having a lower edge and neckengaging means comprising a cylindrical neck, cap-engaging means on

said neck including at least one external circumferential bead on said neck a shoulder extending outward from said neck a plurality of circumferentially spaced protuberance extending upward from said shoulder and outward from said neck, said lower edge of said skirt fitting tightly against the tops of said spaced protuberances when said cap-engaging means engages said neck-engaging means, said protuberances being separated by spaces, said spaces being narrow so that one's fingernails



cannot be inserted under said lower edge to pry said cap off said neck, a downward extending surface formed below said protrusions with a plurality of outward bulging gripper bumper sections which lie in a common plane and are separated by straight surfaces between said gripper sections, each of said bumper sections being elongated circumferentially, whereby downward pressure of said cap on said neck is resisted by said straight surfaces to resist collapse of said gripper sections.

4,566,602

TAMPER-RESISTANT CLOSURE

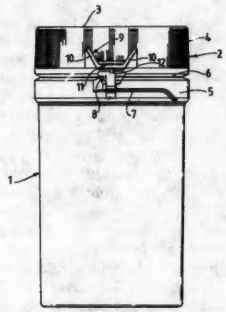
Eugene E. Davis, Ilford, United Kingdom, assignor to Johnsen & Jorgensen (Plastics) Limited, London, England

Filed Dec. 26, 1984, Ser. No. 686,302

Claims priority, application United Kingdom, Jan. 3, 1984, 8400033

Int. Cl.[4] B65D *41/46*

U.S. Cl. 215—256 **9 Claims**



1. A closure for a container wherein the closure has a top, a skirt depending from the top, a tear-away tamper-resistant band connected by frangible means to the skirt and a tear tab on the band characterised in that the tear tab is arranged so that it is inclined outwardly and upwardly so that if the tear tab contacts the rim of a carton when a container, including the closure in position thereon, is being packed into a carton bottom end first the tear tab slides over the rim and does not catch or become hooked on the rim.

4,566,603

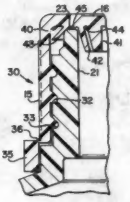
LINERLESS CLOSURE

David N. Moore, Plainfield, Ill., assignor to Phoenix Closures, Inc., Naperville, Ill.

Filed Jul. 12, 1984, Ser. No. 630,002

Int. Cl.[4] B65D *53/00*

U.S. Cl. 215—329 **9 Claims**



1. A threaded closure cap having a skirt portion surrounding an upper portion, said upper portion having an inner surface with a series of annular depending flanges concentric about a common central axis, said depending flanges including a generally flexible outer sealing flange, a generally flexible inner sealing flange and a generally inflexible buttress means, each of said sealing flanges having generally parallel side walls; a ridge located between said inner sealing flange and said outer sealing flange and spaced from each, said buttress means being an innermost flange and spaced from said inner sealing flange to create a channel therebetween while providing a means for conforming said ridge and an upper land surface of a bottle, each of said inner sealing flange and said outer sealing flange providing sealing surfaces upon contact with a bottle mouth wall, said ridge providing a sealing surface upon contact with an upper bottle mouth surface whereby one of said inner sealing flange and said outer sealing flange makes contact with a bottle mouth wall at all times, and said ridge makes a sealing contact with said upper bottle mouth surface at all times, said buttress means providing generally inflexible support to said inner sealing flange upon contact with an irregular bottle having an undersized mouth wall portion, whereby said inner sealing flange is conformed to said bottle mouth wall configuration.

4,566,604

METAL CLOSING DISK AND A PROCESS

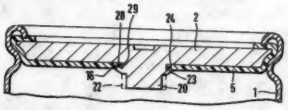
Franz J. Wolf, Sprudelallee 19, 6483 Bad Soden-Salmünster, and Rudolf Klaschka, Tannenweg 9, 7896 Wutöschingen, both of Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,162

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3246890

Int. Cl.[4] H01G *9/10*

U.S. Cl. 220—68 **14 Claims**



1. A metal closure for closing an electrolytic capacitor having a can housing, said closure comprising a disk with a substantially bar-shaped metal extension of smaller diameter secured at the base thereof to a first surface of the disk and a plastic or elastomeric insulating layer applied at least to said first surface, said insulating layer covering the first surface substantially completely and being applied so as to abut the base of the extension, said extension having at least one flange-

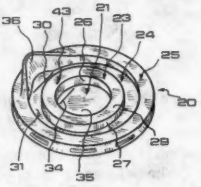
like projection, said projection spaced from the first surface approximately the distance amounting to the thickness of the insulating layer, said projection being turned down onto the insulating layer in press-sealing contact against the first surface of the disk when said closure is positioned in the can housing with a portion of the insulating layer extending between the disk and the housing.

4,566,605

LID FOR DRINKS CONTAINER

J. David Rogers, Toronto, Canada, assignor to Amhil Enterprises Ltd., Mississauga, Canada

Filed Jul. 12, 1985, Ser. No. 754,164
Int. Cl.[4] A47G *19/22*; B65D *41/26*
U.S. Cl. 220—90.2 **13 Claims**



1. A lid for a container of liquids, where the lid is vacuum formed in thin sheet plastic;

where the lid includes a depressed well, which is surrounded by a raised ridge, which is in turn surrounded by a depressed trough, which is in turn surrounded by a raised rim;

where the side walls and top of the ridge are of such height and radial width that a person's thumb and forefinger can be easily placed well in contact with the respective side walls, one inside and one outside the ridge;

where two formed cuts are provided in the material of the lid, each disposed alongside the ridge, where one cut is in the well, and the other cut is in the trough; and

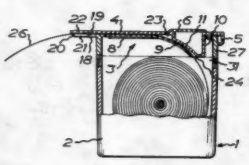
where the side walls and top of the ridge are continuous and extend circumferentially without interruption at least in the region of the ridge that lies beteen the lengths of the cuts.

4,566,606

DISPENSER FOR CONTAINING AND DISPENSING A PREMOISTENED WEB OF MATERIAL

Thord Kling, Svampstigen 8 E, S-671 00 Arvika, Sweden

PCT No. PCT/SE81/00262, § 371 Date May 11, 1983, § 102(e) Date May 11, 1983, PCT Pub. No. WO83/01054, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 15, 1981, Ser. No. 499,764
Int. Cl.[4] G07F *11/66*
U.S. Cl. 221—25 **7 Claims**



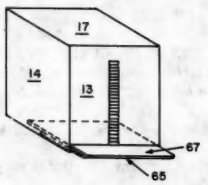
1. A dispenser for containing and dispensing a premoistened web of material (26), comprising a container (2) for containing the web of material and a dispensing portion (3) associated with the container and having an opening (20) for dispensing the web of material, wherein a passage (23) having boundary walls (4, 8) extends between the container (2) and the dispensing opening (20) and is adapted to take up the web of material such that the web of material in the passage (23) constitutes a seal in the passage which prevents drying of said web (26) and wherein the weight of the passage (23) is slightly less than the thickness of the web of material (26), whereby the sealing power of said web in said passage is ensured and friction is brought about between said web and the boundary walls (4, 8) of the passage, said friction facilitating tearing off said web at the dispensing opening (20), said dispensing portion (3) including an inner cover which has a frame member (27) sealingly applicable to the container and a plate (29) which is formed integrally with said frame member and which has a countersunk portion (8) extending in a longitudinal direction of said plate, an opening to the interior of the container which is disposed in said portion (8), and a tongue (9) associated with said countersunk portion and extending downward from said countersunk portion into the interior of the container adjacent said opening, and an outer cover (4) which by hinge means (5) is pivotally connected to the inner cover and which has an inner surface on its side facing the inner cover, said inner surface having a shoulder (10) which, when said two covers are interconnected, is adapted to project into said opening to form, together with said tongue, an inlet opening for the web material (26) into the passage (23) defined between said countersunk portion and the inner side of the outer cover.

4,566,607

BAG DISPENSER

David L. Smith, 101 Sherman St., Albany, N.Y. 12206

Filed May 24, 1984, Ser. No. 613,789
Int. Cl.[4] B65D *5/72*
U.S. Cl. 221—155 **2 Claims**



1. A bag dispenser for the storing therein and drop-down dispensing therefrom of shopping bags, said bag dispenser being reopenable and reclosable for refill storage of shopping bags therein; said bag dispenser comprising a blank divided by fold lines and slit lines to form it into said bag dispenser, said blank defining a front wall, left and right side walls, a back wall, a back wall seal flap, left and right side bottom flaps, a bottom seal flap, a top cover, a top cover lock flap, and left and right side top flaps, said front wall having a fold line dividing it from said left side wall, said front wall having a fold line dividing it from said right side wall, said front wall having a fold line dividing it from said top cover, said left side wall having a fold line dividing it from said back wall, said left side wall having a fold line dividing it from said left side top flap, said left side wall having a fold line dividing it from said left side bottom flap, said back wall having a fold line dividing it from said bottom seal flap, said back wall having a fold line dividing it from said back wall seal flap, said right wall having a fold line dividing it from said right side top flap, said right side wall having a fold line dividing it from said right side bottom flap, said top cover having a fold line dividing it from said top cover lock flap, said top cover having a fold line dividing it from said left side top flap, said top cover having a fold line dividing it from said right side top flap, said right side top flap and top cover being slit along a common line and separating each from the other, said left side top flap and top cover being slit along a common line separating each from the

other, said left side bottom flap and bottom seal flap being slit along a common line separating each from the other, said back wall seal flap and bottom seal flap having self-adhesive portions; in the assembly of said bag dispenser: said back wall, left side wall, front wall and right side wall being appropriately folded to form a box-like structure with said adhesive portion of said back wall seal flap retentively engaged with said right side wall; said right and left side bottom flaps having common edges, said right and left side bottom flaps being folded up with their said common edges disposed in abutting relationship with said adhesive portion of said bottom seal flap disposed in retentive engagement with said right and left side bottom flaps; said right and left side top flaps having first common edges and second common edges, said back wall having a edge, said right and left side top flaps being folded down with their said first common edges disposed in abutting relationship and with their said second common edges being aligned and with said top cover folded down upon said right and left side top flaps and with said top cover lock flap removably inserted in retentive wedging relationship between said edge of said back wall and said aligned second common edges of said right and left side top flaps; said front wall having an inverted T-shaped panel formed by the removal of a weakened tear-line corresponding in configuration thereto providing upon its removal a horizontal slot portion from which said shopping bags stored in said bag dispenser can be dispensed one at a time and providing a vertical slot for visual indication of the number of stored shopping bags; and said bag dispenser being reopenable for refill storage of shopping bags therein by appropriate disengagement of said top cover lock flap from its retentive wedging relationship between said edge of said back wall and said aligned second common edges of said right and left side top flaps and appropriate raising up of said top cover and right and left side top flaps to provide access to said bag dispenser.

4,566,608

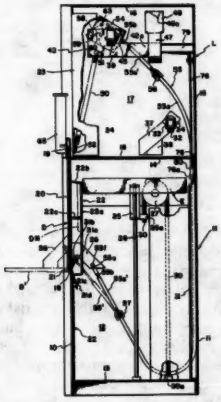
SYSTEM FOR CONVERTING STACK ACCESS NEWSPAPER VENDING MACHINES AND THE LIKE TO APPARATUS FOR DISPENSING PRODUCTS ONE AT A TIME

Reed T. Draper, and Kenneth J. Pol, both of Saginaw, Mich., assignors to Draper Technologies, Inc., Saginaw, Mich.

Continuation-in-part of Ser. No. 613,641, May 24, 1984. This application Jul. 30, 1984, Ser. No. 635,664

Int. Cl.[4] G07F *11/14*

U.S. Cl. 221—229 **22 Claims**



1. In a coin operated newspaper and like article vending machine for dispensing newspapers and like articles on a one-at-a-time basis:

a. a housing forming a cabinet for containing newspapers and like articles to be vended;

b. a door hinged on one side of the cabinet;

c. coin operated lock mechanism for automatically releasably locking the door to the cabinet when the door is swung shut;

d. partition means incorporated with the housing as a wall thereof situated behind the door and providing a dispensing slot behind the door for passing one article at a time;

e. elevator mechanism for assuring the delivery of newspapers successively to a location opposite the dispensing slot;

f. newspaper dispensing elements actuable to engage and move the newspaper partly out the opening;

g. linkage mechanism connecting the door and dispensing elements, operable when the door is swung open, to move the newspaper at least partly out of the opening;

h. members incorporated with the linkage mechanism and dispensing elements for preventing return movement of the newspaper dispensing elements to dispensing position prior to locking of the door via the lock mechanism; and

i. means operating independently of the closing movement of the door for moving the dispensing elements to dispensing position after the door is swung shut and locked.

4,566,609

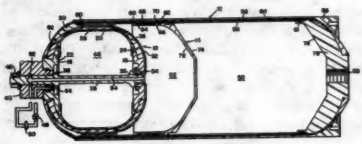
COMPOSITE TANKAGE ARRANGEMENT FOR LIQUID FUEL EXPULSION

Lawrence D. Hoffmeister, New Market, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 3, 1984, Ser. No. 596,341

Int. Cl.[4] B67D *5/42*

U.S. Cl. 222—130 **5 Claims**



1. A composite tankage arrangement comprising a first tank having dome shaped members at opposite ends with a cylindrical intermediate portion between said dome shaped members and said first tank having composite reinforcing materials for allowing a chamber therein to contain high pressure fluid, said first tank having at one end an epoxy dome-like structure of a second tank bonded to an outer surface of the dome structure of said first tank to define a dome structure for said second tank, a cylindrical metal member extending over a portion of said first tank and having one end bonded to said epoxy dome-like structure and having at an opposite end of said cylindrical member a dome structure telescoped and sealed thereto, and a multiplicity of helical layers of composite materials mounted over said epoxy dome-like structure, said cylindrical member and said telescoped dome structure, and hoop layers mounted over a cylindrical portion of the helical layers that extend from over a portion of said epoxy dome-like structure to over a portion of said telescoped dome structure to complete said second tank that completely surrounds said first tank and is integral with said first tank for providing a fuel expulsion tankage arrangement with said first tank within said second tank.

4,566,610
HAND-HELD DEVICE FOR DISPENSING A MULTI-COMPONENT SUBSTANCE

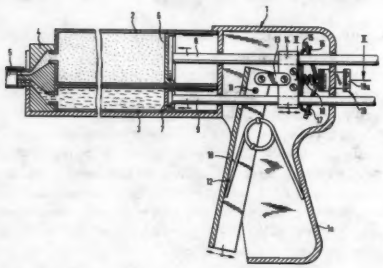
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan Fürstentum, Liechtenstein

Filed Sep. 15, 1983, Ser. No. 532,578

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234250

Int. Cl.⁴ G01F *11/00*

U.S. Cl. 222—137 **3 Claims**



1. A hand-held device for the measured dispensing of a putty-like or paste-like multi-component substance where the components are held in at least two separate containers, comprising a housing member for holding the separate containers, a piston for each said container for displacement through said container for pressing out the contents of the container, a piston rod for each said piston, said piston rods mounted in said housing and being axially displaceable for pressing said pistons into the containers for dispensing the contents of the containers, means associated with each said piston rod for holding said piston rods against displacement in the direction opposite to the direction in which the contents of the containers are dispensed, means for displacing said piston rods and said pistons in the dispensing direction, said means for displacing said piston rods including a drive member engageable with said piston rods, a web member located within said housing adjacent said drive member on the opposite side of said drive member from said pistons, said web member having openings therethrough through which said piston rods extend, said means for holding said piston rods comprising a stop member for each said piston rod, each said stop member being pivotally supported adjacent one end by said web member, and a releasing member in contact with the opposite ends of said stop members from the ends pivotally engageable with said web member, a spring extending between said web member and said stop members for biasing said stop members into holding engagement with said piston rods, and said releasing member mounted on said housing and in contact with said stop members so that by displacing said releasing member against the biasing action of said stop members can be displaced out of holding engagement with said piston

4,566,611
METERING OR ATOMIZING PUMP WITH A PUMP CASING AND AN OPERATING PUSHER

Hans Sukopp, Orsenhausen, Fed. Rep. of Germany, assignor to Firma Ing. Erich Pfeiffer GmbH & Co., Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,105

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225911

Int. Cl.⁴ B65D *83/14*

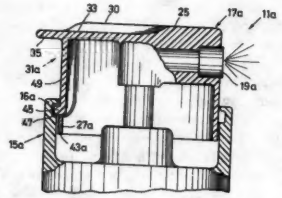
U.S. Cl. 222—153 **8 Claims**

1. A pump for dispensing fluids and like media, comprising:

a pump casing including structure forming a counter locking means;

a pusher for operating the pump, movable from a rest position into the pump casing to deliver a pumping stroke responsive to manual depression of an operating surface formed in an end face of the pusher, the operating pusher being formed by an inverted cup-shaped member;

locking means for the pusher formed by the operating surface and a locking portion rigidly affixed to the operating surface, the locking means being pivotally attached to the pusher to enable movement of the locking portion into and inwardly of a locking position relative to the counter locking means of the pump casing, whereby each pumping



stroke must be preceded by pivotal movement of the locking means and the locking means being formed by a portion of the cup-shaped member which is separated from the remainder of said pusher by slots; and,

resilient means for automatically urging the locking portion outwardly, into the locking position, after each pumping stroke, whereby pressure exerted upon any portion of the end face other than the operating surface will be ineffective for accidentally operating the pump and delivering an unwanted pumping stroke.

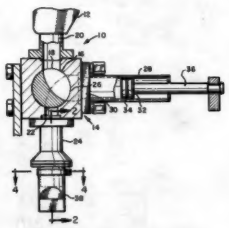
4,566,612
APPARATUS FOR DISPENSING FLOWABLE MATERIAL

Alan von Kreuter, Darien, Conn., assignor to Popsicle Industries, Inc., Englewood, N.J.

Filed Sep. 15, 1983, Ser. No. 532,638

Int. Cl.⁴ G01F *11/04*

U.S. Cl. 222—309 **1 Claim**



1. An apparatus for dispensing a non-homogeneous flowable material containing interspersed solids from a flowable material source comprising:

dispensing means for receiving the material from the material source and for dispensing the material under pressure;

conduit means comprising a generally cylindrical manifold pipe in communication with the dispensing means for receiving the dispensed material, the manifold pipe including a groove extending around the outer surface thereof and an outwardly projecting annular shoulder extending around at least a portion of the outer surface thereof;

a self-closing, elastomeric flap valve having a generally cylindrical body portion which surrounds and is sealed against the manifold pipe, before being installed around

the manifold pipe, the body portion having an inside diameter slightly smaller than the outside diameter of the manifold pipe, the body portion being stressed when installed around the manifold pipe to provide a tight seal, the body portion including an outwardly extending annular flange, the annular flange abutting the annular shoulder when the flap valve is installed on the manifold pipe, the flap valve having a closure portion which is prestressed to remain closed to prevent leakage of the material when no pressure is applied to the dispensed material and which opens to substantially the same dimension as the manifold pipe to permit unobstructed flow of material therethrough upon the application of sufficient pressure upon the dispensed material to force the dispensed material through the closure portion, the closure portion including a pair of generally flat elongated lips which are prestressed to remain in abutting engagement with each other when no pressure is applied to the dispensed material, the length of the lips being such that if any solids remain in the closure portion when no pressure is applied, the lips surround and conform to the shape of the solids to contain the solids and to form a tight seal to prevent leakage of the material; and

clamping means extending around the flap valve body portion axially aligned with the groove for securing the flap valve to the manifold pipe.

4,566,613

MULTIPLE OPENING STRUCTURE RECEPTACLE

Timothy Anscomb, Chailey, Nr. Lewes, England, assignor to Schering-Prebbles Limited, Bootle, United Kingdom

Filed Aug. 3, 1983, Ser. No. 519,960

Claims priority, application United Kingdom, Aug. 3, 1982, 8222426

Int. Cl.⁴ B65D *47/10*

U.S. Cl. 222—541 **24 Claims**

1. A hand-held receptacle for storing pourable contents comprising:

(a) receptacle storage means comprising a storage portion and a generally tapered end portion through which contents stored therein may be discharged, the generally tapered end portion having a top and a base;

(b) dual opening means arranged on said generally tapered end portion, said dual opening means being comprised of a first pre-defined breaking point situated toward the top of the tapered end portion, and a second pre-defined breaking point situated toward the base of the tapered end portion, said second pre-defined breaking point being located proximate said storage portion, said first and second breaking points providing a user with the option of releasing the contents by the application of a twisting or snapping motion to said first breaking point, or by the application of pressure to the second breaking point to break open the receptacle at one of the breaking points as desired;

(c) said second breaking point being an abrupt neck portion of a small diameter than the tapered end portion said abrupt neck portion having a wall extending between a pair of opposed surfaces on the tapered end portion, said opposed surfaces extending radially with respect to the axis of the tapered portion; and

(d) spaced web members adjoining both the wall of the neck portion and the opposed surfaces for strengthening the neck portion and determining the direction of breakage of the neck portion.

4,566,614

CASTING NOZZLE

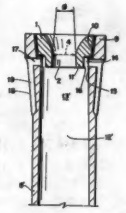
Björn Frykendahl, Ljungvalls väg 6, 683 00 Hagfors, Sweden

Filed Oct. 12, 1983, Ser. No. 541,053

Claims priority, application Sweden, Oct. 15, 1982, 8205881

Int. Cl.⁴ B22D *37/00*

U.S. Cl. 222—603 **9 Claims**



1. A casting nozzle and casting pipe combination for metallurgical process, through which nozzle a metal bath is intended to flow out, where gas, such as argon or nitrogen gas or a mixture of gas and powderous material, is intended by means of an injection lance or the like to be injected as a jet stream into the bath in connection to the nozzle, characterized in that the through hole (2) of the nozzle (1) is shaped substantially conically, with a cross-sectional area increasing in the intended flow direction, said pipe having (1) a seat (10) or the like at the upper end (9) of the casting pipe (8) to enable said nozzle to co-operate with the casting pipe (8), so that a lower portion (11) of the casting nozzle (1) comprising the outlet opening of the through hole (2) freely projects down in an upper portion (13) of the through passageway (12) of the casting pipe, and that said upper portion (13) has such a width, that a gap (14) is formed between the wall (15) of the through passageway (12) and outer wall (16) of the downward projecting portion (11) of the nozzle, and that the casting pipe at the upper portion (13) comprises at least one evacuation hole (17) for gas.

4,566,615

APPARATUS FOR TURNING A CIRCULAR KNIT HOSE INSIDE OUT AND SECTIONING SAME INTO UNIT HOSES

Tomotake Nakahira, 140-5, Tsukiyama, Yamatotakadashi, Naraken, Japan

Filed Jan. 17, 1984, Ser. No. 571,485

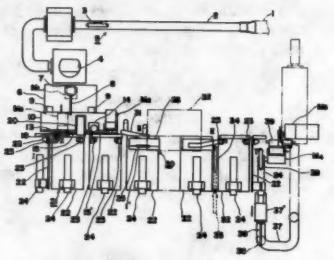
Int. Cl.⁴ A41H *43/00*

U.S. Cl. 223—43 **1 Claim**

1. An apparatus for turning a circular knit hose inside out, sectioning the knit hose into unit hoses, and linking each toe portion thereof with stitches, the apparatus comprising:

an air suction pipe for pulling a long knit hose by air suction therethrough, a cutter unit mounted on a movable carrier, the cutter unit having means whereby the knit hose is stretched so as to ensure an easy cutting, an apron conveyor having slats transversely provided, each of the slats including a hollow cylinder for allowing a circular knit hose to be supported thereon, and a clamp unit located at the opposite side to the cylinder, the clamp unit being capable of tilting toward the cylinder, a linking device located at a position where the clamp unit is tilted, means for releasing the knit hose from the clamp unit, and a

suction duct for pulling the unit knit hose by suction, the suction duct being communicatable with the rear end of



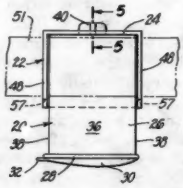
the cylinder which comes to the turning point of the conveyor.

4,566,616

CONTAINERS AND HOLDERS FOR USE IN SECURING SUCH CONTAINERS TO BELTS

Leif Rise, 7748 Westlawn Ave., Los Angeles, Calif. 90045

Filed Jun. 7, 1984, Ser. No. 618,062
Int. Cl.[4] A45F 5/00
U.S. Cl. 224—253 **5 Claims**



1. In the combination of a container and a holder which is used to secure the container to a belt so that the container can be easily attached to or detached from the belt through the use of the holder the improvement which comprises:

said container having ends and a body portion extending between and separating said ends,

said holder being shaped so as to include an open end, a closed end and a body portion extending between said ends and shaped so as to fit around at least a portion of said body portion of said container, said holder is formed of a material capable of being temporarily deformed,

coacting means for removably securing one of said ends of said container to said closed end of said holder, one of said coacting means being located on said one of said ends of said container and the other of said coacting means being located on said closed end of said holder, said coacting means in said container comprises ratchet means, said coacting means on said holder comprises pawl means,

said container is capable of being secured to said holder by moving said container through said open end of said holder so that said ratchet means engage said pawl means so as to be held thereby,

said body portion of said holder is temporarily deformed when said pawl means contacts said ratchet means and reverts back to its initial position when said, ratchet means are engaged by said pawl means,

said body portions of said holder are capable of being manipulated so as to be deformed to a sufficient extent to disengage said pawl means from said ratchet means,

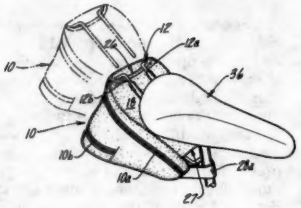
said holder also including belt engagement means for use in securing said holder to a belt.

4,566,617

SEAT PACK ASSEMBLY

W. Shaun Jackson, 2860 Tessmer Rd., Ann Arbor, Mich. 48103

Filed Jul. 13, 1984, Ser. No. 630,856
Int. Cl.[4] B60R 7/00; B62J 7/00
U.S. Cl. 224—275 **11 Claims**



1. A removable underseat pack assembly for cycles comprising:

A. a pack;

B. a first mounting bracket defining one or more elongated finger portions;

C. a second mounting bracket defining one or more elongated tubular portions having an inner diameter slightly larger than the diameter of the finger portion of the first mounting bracket for removable telescopic receipt of said finger portion;

D. means for securing one of said mounting brackets to said pack; and

E. clamp means for rigidly securing the other of said mounting brackets to the rear underside portion of the bicycle seat,

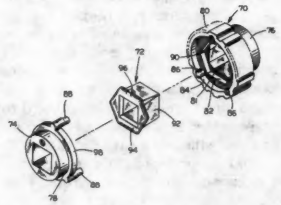
whereby the pack may be mounted on the bicycle by securing the pack to said one mounting bracket, rigidly securing said other mounting bracket to the rear underside portion of the bicycle area, and telescopically inserting the elongated finger portion of the first mounting bracket into the elongated tubular portion of the second mounting bracket.

4,566,618

PAPER FEED TRACTOR WITH COMPENSATING PULLEY ASSEMBLY UTILIZING CANTABLE INSERT

Alan F. Seitz, New Hartford, and Karl G. Seitz, Goshen, both of Conn., assignors to Data Motion, Inc., Torrington, Conn.

Filed Nov. 10, 1983, Ser. No. 550,362
Int. Cl.[4] B65H 17/40
U.S. Cl. 226—74 **22 Claims**



1. In a drive tractor for web material, the combination comprising:

A. a chassis having a pair of spaced transversely extending apertures therein, at least one of said apertures being adjacent an end thereof;

B. a flexible endless belt extending about said chassis generally perpendicularly to the axes of said apertures, said belt

defining a closed path of travel thereabout and having an outer driving surface to engage the web material and an inner driven surface; and

C. a pulley rotatably mounted in said one of said chassis apertures for rotation within said one chassis aperture with its peripheral surface portion in engagement with said driven surface of said belt, said pulley having a passage therethrough for receiving a drive shaft to effect rotation of said pulley and thereby said belt, said pulley having a body with a passage therethrough extending along an axis perpendicular to the radius defining said peripheral surface portion of said pulley and substantially coaxial with said one chassis aperture, said pulley also having a cantable insert received within said body passage and cantable in said body passage relative to said body, said insert having a passage therethrough providing at least a portion of said shaft receiving passage extending through said pulley, said portion of said shaft receiving passage provided by said insert passage being configured and dimensioned to grip the associated drive shaft at all times, whereby the associated drive shaft may produce canting of said cantable insert within said body passage to accommodate irregularities in the associated drive shaft and variations in spacing between the axes of the associated shafts during operation of the tractor, the radius of the peripheral surface portion of said pulley being substantially perpendicular to the closed path of travel of said belt during rotation of said pulley.

4,566,619

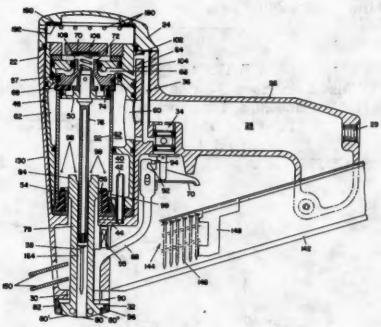
PNEUMATIC FASTENER-DRIVING TOOL AND METHOD

Edward O. Kleinholz, Yucca Valley, Calif., assignor to The Kiesel Co., St. Louis, Mo.

Continuation of Ser. No. 171,720, Jul. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 84,367, Oct. 12, 1979, abandoned, which is a continuation of Ser. No. 899,514, Apr. 24, 1978, abandoned. This application Oct. 26, 1984, Ser. No. 664,944

Int. Cl.[4] B25C *1/04, 7/00*

U.S. Cl. 227—8 **20 Claims**



1. Apparatus for effecting single-stroke driving of a fastener into a workpiece, said apparatus comprising:

(a) a relatively light-weight, portable housing,

(b) piston means movably mounted in said housing and associated with fastener-driver means for single-stroke driving of a fastener into a workpiece when said piston means is pneumatically actuated in a direction toward said workpiece,

(c) means to deliver high-pressure air to the side of said piston means remote from said workpiece, to thus effect said pneumatic actuation,

(d) reciprocator means movably mounted in said housing for movement in a direction away from said workpiece in response to said delivery of high-pressure air, and

(e) means, operative when (1) said fastener has been substantially completely driven into said workpiece, and (2) said reciprocator means is moving in a direction away from said workpiece to provide a mechanical stopping relationsip between said piston means and said reciprocator means,

said mechanical stopping relationship being such that said piston means, when at or near the bottom of its stroke and relatively adjacent said workpiece, provides at least a substantial degree of stopping action on said thus-moving reciprocator means.

4,566,620

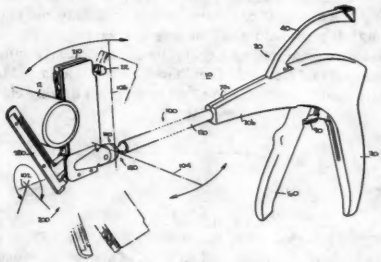
ARTICULATED SURGICAL FASTENER APPLYING APPARATUS

David T. Green, Norwalk, and Ernie Aranyi, Shelton, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 19, 1984, Ser. No. 662,677

Int. Cl.[4] A61B *17/04;* B25C *5/00*

U.S. Cl. 227—19 **32 Claims**



1. Surgical fastener applying apparatus comprising:

a distal fastener applying assembly including (a) a fastener holding part initially containing at least one surgical fastener, (b) an anvil part movable relative to the fastener holding part for clamping tissue to be fastened between the fastener holding part and the anvil part, and (c) first means for driving the fastener from the fastener holding part at least partly through the clamped tissue to the anvil part;

a proximal actuator assembly including second means for producing the work necessasry to operate the first means; and

a longitudinal shaft assembly for connecting the fastener applying assembly to the actuator assembly, for supporting the fastener applying assembly relative to the actuator assembly, and for operatively transmitting the work produced by the second means to the first means, the shaft assembly including a joint for allowing rotation of the fastener applying assembly relative to the actuator assembly about each of three mutually orthogonal axes.

4,566,621

MEANS FOR ASSOCIATING A DRIVER, CONSTITUTING A PART OF A REPLACEABLE FASTENER CONTAINING MAGAZINE, WITH THE DRIVER OPERATING MECHANISM OF A FASTENER DRIVING TOOL

Carl T. Becht, Cincinnati, Ohio, assignor to Sencorp, Cincinnati, Ohio

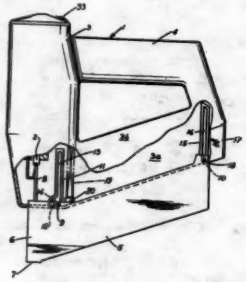
Filed Jul. 3, 1984, Ser. No. 627,411

Int. Cl.[4] B25F *1/02, 3/00;* B25C *5/00*

U.S. Cl. 227—109 **13 Claims**

1. In a fastener driving tool of the type comprising a body, a driving element said driving element having a free end within said body, a fastener-containing magazine manually attachable

and detachable from said tool, the improvement comprising a fastener driver constituting a part of said magazine and having a free end outside said magazine and a driving end within said magazine, and means for associating said fastener driver with said driving element. said last mentioned means comprising at



least one resilient member, said at least one resilient member having a first end affixed to one of said tool body and said tool driving element, said resilient element having a second end releasably engageable with said fastener driver and configured to maintain said free end of said fastener driver adjacent to and slightly spaced from said free end of said tool driving element.

4,566,622

STRIKING APPARATUS FOR FASTENERS

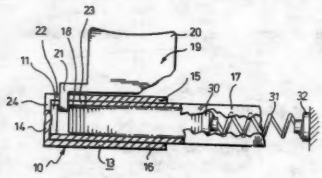
Bruno Ghibely, Ahrensburg, Fed. Rep. of Germany, assignor to Esco Metallwaren Martin Hühnken

Filed Apr. 20, 1984, Ser. No. 602,443

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 8313386[U]

Int. Cl.⁴ B25C *7/00*

U.S. Cl. 227—120 **6 Claims**



1. A fastener striking apparatus for fasteners, especially for staples, nails, etc., comprising a housing with a power-driven plunger arranged therein, a tool portion containing a fastener channel with the plunger guided therein during the operation of striking, and a magazine for the fasteners with the fasteners advanced therein with the aid of a spring-biased feeder in the direction of the fastener channel, characterized in that an adjustable resetting member **(19)** is provided which when in the normal position has a cam **(21)** projecting into a recess **(24)** of the tool portion **(10)** on the side of the fastener channel **(11)** opposite the magazine **(17)** and which upon adjustment against the feeding direction of the fasteners **(18)** in the magazine is adjustable to such an extent that the respective foremost staple **(18)** together with the cam **(21)** is disposed outside the fastener channel **(11)**.

4,566,623

METHOD OF PRODUCING A METAL TUBE AND FLANGE ASSEMBLY

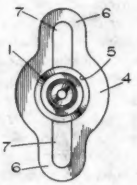
Jurgen Dufft, Kenilworth, England, assignor to Lucas Industries Limited, Birmingham, England

Division of Ser. No. 375,192, May 5, 1982, Pat. No. 4,477,010. This application Jun. 26, 1984, Ser. No. 624,838

Claims priority, application United Kingdom, May 27, 1981, 8116113

Int. Cl.⁴ B23K *31/00*

U.S. Cl. 228—138 **4 Claims**



1. A method of producing a pressure cylinder assembly for use in an hydraulic master cylinder comprised of a metal tube and a flat plate-like mounting flange member attached to the tube, comprising the steps of forming in the flange member an opening which includes a part generally matching the external contour of the tube and being, when the flange member is unstressed, large enough to surround with clearance a portion of the external periphery of the tube at the position where the flange member is to be attached, said opening also including a slot extending outwardly from said matching part and being open at its end remote from said matching part and being arranged and dimensioned to permit contraction of said matching part by resilient deformation of the flange member by application of a force in the region of the slot, passing the tube through said opening part to a desired position of attachment to the tube, deforming the flange member by applying a force in the region of the slot to radially inwardly contract said matching part into engagement with the tube, holding said matching part in engagement with the tube, and securing the flange member in position by welding it to the metal tube during said holding step.

4,566,624

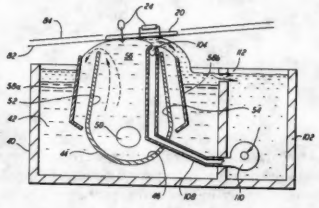
MASS WAVE SOLDERING SYSTEM

Matthias Comerford, Newton Highlands, Mass., assignor to Hollis Automation, Inc., Nashua, N.H.

Filed Dec. 16, 1983, Ser. No. 562,407

Int. Cl.⁴ H05K *3/34*

U.S. Cl. 228—180.1 **34 Claims**



1. A method of reducing the incidence of solder shorts, icicling and/or bridging in a mass soldering process in which a quantity of molten solder is deposited onto the underside of a component-carrying printed circuit board and onto those parts of said components which extend below said board underside so as to at least partially fill with molten solder any holes in said board, said method comprising the steps of:

depositing a quantity of molten solder onto the underside of said board and said component by passing the underside of said board and said component parts at least in part in contact with a wave of molten solder, and, substantially immediately following said depositing, flowing oil into contact with the underside of said board, said component parts and molten solder thereon thereby to relocate or remove a portion of the molten solder deposited on said board and component parts before said molten solder solidifies thereon, said supply of oil being flowed through said solder wave into contact in part with the underside of said board and said component parts to create a stream of substantial thickness to substantially completely immerse the joints being formed, said immersion of said joints occurring substantially immediately following removal of said board underside from contact of said board and component parts with said solder wave.

2. A method according to claim 1, wherein said oil in contact with said board has a temperature at least equal to that of solder in said wave.

4,566,625

METHOD FOR DIFFUSION WELDING

Per H. Moe, Amtmann Bangs gate 7, N-3000 Drammen, Norway

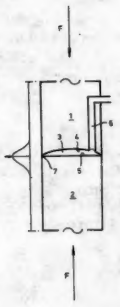
PCT No. PCT/NO83/00010, § 371 Date Dec. 12, 1983, § 102(e) Date Dec. 12, 1983, PCT Pub. No. WO83/03565, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 13, 1983, Ser. No. 568,195

Claims priority, application Norway, Apr. 13, 1982, 821208; Apr. 12, 1983, 831296

Int. Cl.⁴ B23K *20/00*

U.S. Cl. 228—265 **8 Claims**



1. An improved method for joining one metal part to another metal part by diffusion welding, said metal parts being elongate and having a generally constant first cross section, comprising the steps:

establishing a joint between opposed bounding surfaces on said one and said other parts, said opposed surfaces defining therebetween, before welding, a cavity with generally increasing height from the periphery of said cavity toward the middle thereof, said one part having a connecting conduit passing through said part and communicating with said cavity, said parts each having a reduced cross section in the area of said joint, before welding;

heating said one and said other parts to a predetermined temperature at least in areas of said parts bordering said joint;

pressing said one and said other parts together toward said joint;

supplying a reducing flushing gas to said cavity via said conduit during said heating and said pressing until said joint is tightly closed, said opposed surfaces being diffusion welded at at least said periphery of said cavity;

further pressing said parts together, with a predetermined speed, until said areas having initially reduced cross sections have second cross sections, after welding, substantially equal to said generally constant first cross section of said elongate parts; and

cooling said parts.

4,566,626

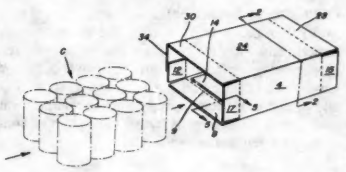
END LOADING CAN CARTON

Prentice J. Wood, Hapeville; James R. Oliff, Austell, and Richard K. Watkins, Lithonia, all of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 26, 1985, Ser. No. 716,163

Int. Cl.⁴ B65D *5/02*

U.S. Cl. 229—37 R **6 Claims**



1. An end loading can carton comprising a normally horizontal bottom wall, a pair of side walls foldably joined respectively to opposite side edges of said bottom wall, a normally horizontal top wall foldably joined along the side edges thereof to the upper edges of said side walls respectively to form a sleeve with said side walls and the axes of the packaged cans in normal relation to said bottom and said top walls, an end flap foldably joined to each end of said bottom, top and side walls along a fold line which defines the associated end edge of the associated wall, and a reinforcing panel secured in flat face contacting relation to the inner surface of one of said normally horizontal walls for directly engaging the adjacent ends of the packaged cans, the fold line adjoining the end flap at one end of said one normally horizontal wall being inwardly embossed for engaging the adjacent ends of cans to be packaged during loading of the cans into the carton thereby to minimize possible disruptive engagement of the adjacent can ends with the adjacent end edge of said reinforcing panel.

4,566,627

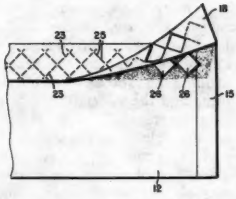
TAMPER DETECTION ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 536,347, Sep. 27, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 719,224

Int. Cl.⁴ B65D *27/14, 27/30*

U.S. Cl. 229—81 **2 Claims**



1. In a tamper detectable envelope, the combination of a body portion formed from a front panel and rear panel with side flaps foldably connected to one of said panels and adhered to the other of said panels, a closure flap foldably connected along a score line to the top edge of one of said panels and adapted to be adhered to the other of said panels, said closure flap including:

(a) opposed side edges and a straight free edge opposite said score line;

(b) a plurality of spaced apart and parallel lines of slits applied to the closure flap which extend substantially from one side edge thereof to the other, and which criss cross one another at substantially right angles to produce a plurality of subpanels within the closure flap of generally diamond shaped configuration, each of said slits being separated from the next succeeding slit in its line and from the adjacent slits in the criss cross lines by normally unbroken connectors, said connectors comprising uncut segments of the closure flap located at least at each point of each diamond shaped subpanel, said parallel lines of slits extending from the general area of said score line to a point substantially near the free edge of said closure flap; and,

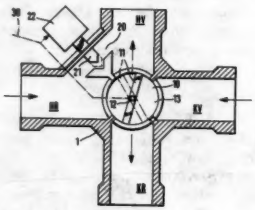
(c) adhesive material applied between the closure flap and said other panel so that after the envelope is closed and sealed, any attempt to open the envelope by lifting the closure flap will sever one or more of the connectors between said slits and leave attached to said other panel one or more of the generally diamond shaped subpanels of said closure flap to provide visual evidence that the envelope has been tampered with.

4,566,628

METHOD OF AND SYSTEM FOR CONTROLLING THE RATIO BETWEEN THE WATER FLOW RATE IN THE PRIMARY CIRCUIT AND THE WATER FLOW RATE IN THE SECONDARY CIRCUIT OF A HOT WATER HEATING SYSTEM

Hans R. Latarius, Essen, Fed. Rep. of Germany, assignor to Tekmar Angewandte Elektronik GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,897
Int. Cl.[4] F24D 3/00; E03B 7/07
U.S. Cl. 237—8 C **21 Claims**



1. In a hot water heating system comprising a primary circuit, a secondary circuit and a multi-way mixing device connected with the primary and secondary flow and return pipework for mixing primary circuit and secondary circuit water and fitted with control means for changing or adjusting the water flow rates in said primary and secondary circuits, a method of controlling the ratio between the water flow rate in the primary circuit and the water flow rate in the secondary circuit comprising the steps of:

providing an adjustable bypass in communication with the secondary circuit return piping suitable for feeding an additional quantity of return water into the secondary circuit flow piping bypassing said mixing device;

mixing said additional quantity of return water with the secondary circuit flow water passing through said mixing device; and

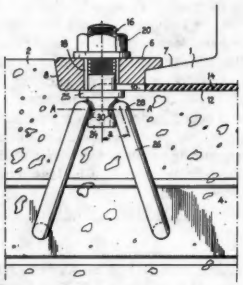
controlling said bypass in response to the position of the mixing device control means and substantially closing said bypass when the way from the primary circuit flow piping through said mixing device to the secondary circuit flow piping is fully opened, thereby achieving good control characteristics over substantially the entire control range of said mixing device and fast control response.

4,566,629

STRUCTURE FOR FIXING A RAIL TO A TIE

Roger P. Sonneville, Annapolis, Md., assignor to Sonneville International Corporation, Washington, D.C.

Filed Sep. 22, 1983, Ser. No. 534,623
Claims priority, application France, Mar. 2, 1983, 83 03426
Int. Cl.[4] E01B 9/28, 3/28
U.S. Cl. 238—117 **12 Claims**



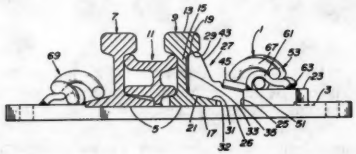
1. A structure for use in fixing a rail to a tie, and in particular a composite tie comprising two concrete blocks interconnected by a steel strut, which strut is axially extended into each of the blocks, said structure comprising a screwthreaded member having a lower end which is intended to be embedded in the respective concrete block above said strut and in alignment with the axis of symmetry of the strut, four rods extending in a divergent manner from said lower end for assuming positions on each side of the strut and having such lengths as to terminate in the vicinity of the level of the neutral axis of the strut, said rods comprising branches of two divergent arch elements having upper portions welded to diametrically opposed parts of said lower end of said member.

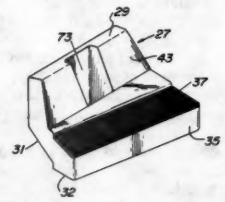
4,566,630

BOLTLESS, FRICTION-FIT, ADJUSTABLE RAIL BRACE

Tilghman H. Keiper, Jr., Camp Hill, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 23, 1984, Ser. No. 602,776
Int. Cl.[4] E01B 9/60, 9/48
U.S. Cl. 238—292 **4 Claims**





1. A boltless, friction-operated, adjustable brace for bracing a single rail or a pair of parallel, spaced-apart rails, the brace, in combination, comprising:

(a) a tie plate having a bed longitudinally crossing the tie plate, for carrying the rails;

(b) a stop block affixed to the tie plate adjacent the bed, the stop block having an upstanding front frictional surface extending longitudinally of the tie plate and angled toward the bed;

(c) the tie plate having a horizontal frictional surface adjacent to the upstanding front frictional surface of the stop block; and

(d) a removable side brace contacting one of the rails, the side brace having:

(i) means for frictionally engaging the rail, said means including a top surface for frictionally engaging a fishing area on a rail, and a slanted bottom surface for frictionally engaging a flange portion on a rail;

(ii) means for frictionally engaging the tie plate, said means including an upstanding front surface extending longitudinally of the tie plate, the surface extending parallel to and frictionally engaging the stop block front frictional surface; and a horizontal bottom surface extending longitudinally of the tie plate, the surface extending parallel to and frictionally engaging the tie plate horizontal frictional surface;

(iii) means for interference engagement between the side brace and the stop block; and

(e) spring clip means for resiliently holding the side brace and stop block together.

4,566,631

ELECTRICALLY INSULATING RAILWAY RAILS FROM RAIL-FASTENING MEANS

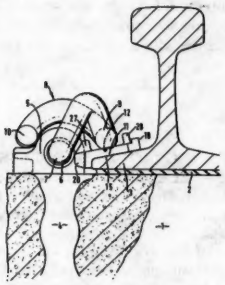
Trevor P. Brown, Orpington, England, assignor to Pandrol Limited, London, England

Filed Feb. 15, 1983, Ser. No. 466,495

Claims priority, application United Kingdom, Feb. 15, 1982, 8204364

Int. Cl.⁴ E01B *9/30, 9/34*

U.S. Cl. 238—349 **5 Claims**



1. A device which is suitable for use in a railway track to electrically insulate a flange-footed railway rail from a rail clip, which bears downwardly upon the upper surface of the rail flange, and from an anchorage, at one side of the rail flange, for the rail clip, the device comprising an electrically insulating member having a first portion which is to be interposed between the rail clip and the upper surface of the rail flange and also having a second portion which is to be interposed between the edge of the rail flange and the anchorage and which extends downwardly from one side of the first portion and terminates in a terminal edge of the electrically insulating member vertically below said one side, the device also comprising a metallic reinforcing member comprising an elongate portion, which has a flat lower surface and is to be interposed between the rail clip and the first portion of the insulating member, first and second spaced-apart and substantially parallel reinforcing ribs which extend along and upwardly from said elongate portion near opposite sides thereof, the first rib being the nearer to the second portion of the electrically insulating member, two spaced-apart projections extending sideways from the remainder of said reinforcing member, between which part of the anchorage is to lie so that said reinforcing member cannot move far along the rail, and no part below said flat lower surface, there being near one end or each end of the reinforcing member a further rib projecting upwardly from said elongate portion, perpendicular to the reinforcing ribs and less tall than the latter.

4,566,632

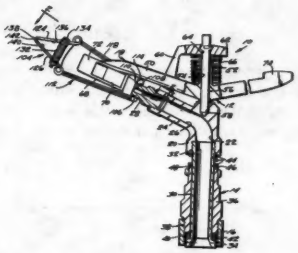
STEP-BY-STEP ROTARY SPRINKLER HEAD WITH IMPROVED STREAM DIFFUSING ASSEMBLY

George L. Sesser, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed May 5, 1983, Ser. No. 492,031

Int. Cl.⁴ B05B *3/08*

U.S. Cl. 239—230 **9 Claims**



1. A step-by-step rotary head comprising

a sprinkler body having an inlet and at least one outlet communicating with said inlet,

means mounting said sprinkler body for rotational movement about a generally vertical axis and for communicating the inlet of said sprinkler body with a source of water under pressure,

nozzle means in said at least one outlet for directing water under pressure communicated with said inlet outwardly of said nozzle means in a cylindrical water stream flowing in an upward and outward direction,

means mounted for rotational movement with said sprinkler body and for cyclical movements with respect thereto between a position of stream engagement and a spaced position out of stream engagement for effecting step-by-step rotational movements of said sprinkler body in conjunction with said cyclical movements, and

stream diffusing means disposed outwardly of the position of stream engagement of said step-by-step movement effecting means for engaging the cylindrical water stream when the latter is out of said position of stream engagement and diffusing said cylindrical water stream into a fan-shaped spray which is fanned out in a generally horizontal direction,

said stream diffusing means including a pair of vertically spaced upper and lower stream engaging plates, the lower of said stream engaging plates providing an upwardly and inwardly facing stream engaging surface means disposed in a position to engage a lower portion of the cylindrical water stream so that said fan-shaped spray flows in an upwardly and outwardly extending direction after disengagement therefrom.

4,566,633

LONG RANGE SPRINKLER WITH CONTROLLED APPLICATION RATE

Isaac Rinkewich, 12 Fishman Maimon St., Tel-Aviv, Israel

Filed Mar. 29, 1984, Ser. No. 594,727

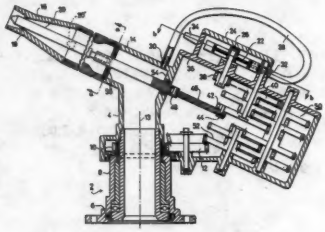
Claims priority, application Israel, Aug. 4, 1983, 69428

Int. Cl.⁴ B05B *3/04*

U.S. Cl. 239—237 **19 Claims**

1. A water sprinkler, comprising: a housing having an inlet connectable to a pressurized water supply line, and a nozzle through which the water issues in the form of a jet; a control member cyclically movable between a first limit position

wherein the nozzle is open with an enlarged area to thereby increase the range and rate of water flow therethrough, and a second limit position wherein the nozzle is still open but its



area is restricted to thereby decrease the range and rate of water flow therethrough; and a drive driven by the energy of the water in the pressurized water supply line for cyclically driving said control member to enlarge and restrict the nozzle.

4,566,634

INJECTION DEVICE FOR A DIESEL ENGINE

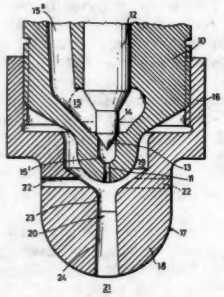
Herbert Wiegand, Cologne, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 529,978

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234829

Int. Cl.[4] F02M *61/16*

U.S. Cl. 239—410 **19 Claims**



1. An injection device for a diesel engine having a combustion chamber, in particular a diesel engine with direct injection, the injection device having a nozzle body which has a duct that is blockable and releasable by a controlledly movable valve needle, wherein the nozzle body duct opens into at least one discharge nozzle, the improvement wherein the nozzle is surrounded by an ejector attachment which has (a) a mixing duct oriented axially with respect to the discharge nozzle, and leading from the discharge nozzle outlet into the combustion chamber, and (b) at least one lateral air duct opening leading from the combustion chamber into the mixing duct, whereby the injection jet leaving the discharge nozzle entrains air drawn in by suction from the combustion chamber via the air duct.

4,566,635

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

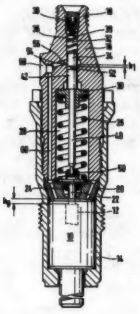
Dietrich Trachte, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 600,044

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328824; Dec. 8, 1983, 3344396

Int. Cl.[4] F02M *47/02*

U.S. Cl. 239—533.8 **10 Claims**



1. A fuel injection nozzle for internal combustion engines having a nozzle housing and a valve needle pre-tensioned by a closing spring, said valve needle having a first pressure shoulder engaged continuously by fuel pressure in an opening direction of said valve needle and further having means for opening an auxiliary fuel conduit to allow said fuel pressure to act upon a spring-loaded reservoir piston and a second pressure shoulder of said valve needle upon termination of a pre-injection phase, said second pressure shoulder being arranged to point in an opposite direction from the first pressure shoulder, and said means for opening said auxiliary fuel conduit opens said conduit in accordance with a stroke of said valve needle.

4,566,636

PRODUCING LIQUID DROPLETS BEARING ELECTRICAL CHARGES

Kenneth S. Sachar, Brookline, and Stanley R. Rich, Wellesley Hills, both of Mass., assignors to Micropure, Incorporated, Natick, Mass.

Continuation of Ser. No. 512,746, Jul. 11, 1983, abandoned, which is a continuation of Ser. No. 278,660, Jun. 29, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 707,531

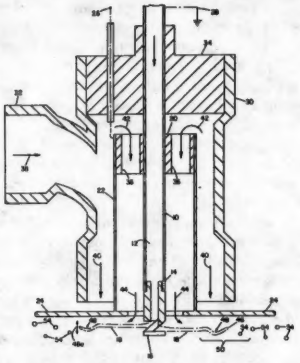
The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] B05B *5/02*

U.S. Cl. 239—698 **16 Claims**

1. Apparatus for producing liquid droplets bearing electrical charges comprising means to produce an unsupported flowing area-wise expanding sheet of liquid which is bounded by a pair of surfaces and which becomes thinner as it expands in the direction of flow into a randomly-fluctuating zone-of-instability extending a substantial distance in said direction of flow wherein said sheet becomes unstable and breaks into droplets, charge-inducing means nearby and spaced from one surface of said sheet and conforming in shape generally with the flow of said expanding sheet for inducing an electric charge on at least said one surface of said sheet, said charge-inducing means extending continuously over said sheet prior to and including said zone-of-instability including the region in which said droplets are formed and said droplets immediately after they are formed so as to maintain said electric charge on the sur-

faces of said droplets as they are formed and immediately thereafter without regard to fluctuation in the instantaneous



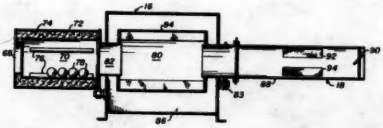
location within said zone-of-instability of the separation of said droplets from said sheet.

4,566,637

THERMAL SAND RECLAMATION SYSTEM

Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 369,069, Apr. 16, 1982, Pat. No. 4,487,372. This application Jun. 27, 1984, Ser. No. 625,286
Int. Cl.⁴ B02C *19/12*
U.S. Cl. 241—23 **8 Claims**



1. A method of reclaiming used foundry sand that contains organic matter, dust, fines and ferrous metal comprising the steps of:

(a) providing a supply of used foundry sand containing organic matter, dust, fines and ferrous metal and having a temperature approximately that of ambient temperature;

(b) heating the used foundry sand containing organic matter, dust, fines and ferrous metal to raise the temperature of the used foundry sand from approximately ambient temperature to a temperature of approximately 1300° F. to effect the thermal removal of organic matter from the used foundry sand while leaving the dust, fines and ferrous metal therein;

(c) removing through heat transfer to a cooling medium and subsequent to the thermal removal of the organic matter heat from the used foundry sand containing dust, fines and ferrous metal to effect a cooling of the used foundry sand;

(d) separating through mechanical separation and subsequent to both the thermal removal of organic matter and the cooling of the used foundry sand ferrous metal from the used foundry sand containing dust, fines and ferrous metal while leaving the dust and fines therein; and

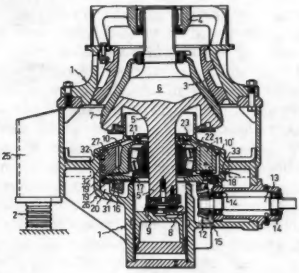
(e) scrubbing through the interaction of the sand particles and subsequent to the thermal removal of the organic matter and the cooling of the used foundry sand and the separation of the ferrous metal the used foundry sand containing dust and fines to dislodge the dust therefrom.

4,566,638

CONE CRUSHER

Sven-Ake Lundin, Malmö, and Arvid Svensson, Vintrie, both of Sweden, assignors to Svedala-Arbra AB, Svedala, Sweden

Filed Oct. 19, 1983, Ser. No. 543,265
Claims priority, application Sweden, Oct. 22, 1982, 8206003
Int. Cl.⁴ B02C *2/06*
U.S. Cl. 241—37 **9 Claims**



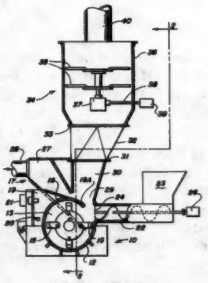
1. A cone crusher comprising a shaft mounted in a frame for gyratory oscillating movement, a rotor rotatably mounted on the shaft, and a drive adapted to rotate the rotor on said shaft, said rotor having an out-of-balance weight so that the rotation of the rotor in conjunction with centrifugal force sets the shaft in a gyratory oscillating motion, whereby a conical crushing head carried by the shaft is caused to roll on the inner side of an annular conical crushing mantle carried by the frame, characterised by a movable counterweight which is adapted to be driven by the drive in a circular movement about and radially spaced from said shaft and which is maintained in a position always angularly displaced substantially 180° relative to the movement of the eccentrically located point of gravity of the rotor, said counterweight being carried radially displaceably relative to the shaft on a support member movable in an orbit about the shaft by means of the drive.

4,566,639

CENTER FEED MATERIAL GRINDING MILL

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Aug. 27, 1984, Ser. No. 644,579
Int. Cl.⁴ B02C *13/288*
U.S. Cl. 241—52 **6 Claims**



1. Material grinding mill comprising:

a mill base frame having spaced side walls;

a rotary shaft operatively carried by an opposed pair of said side walls and a group of material grinding elements car-

ried by said shaft in positions to be spaced from said pair of side walls;

a closed semi-cylindrical liner extending between said pair of side walls and enclosing the group of grinding elements;

a scroll liner forming a cylindrical shaped continuation of said closed liner and having side margins spaced from said pair of side walls, said scroll liner and said closed liner forming a generally cylindrical material grinding chamber having axially spaced openings adjacent said pair of side walls above said closed liner and said scroll liner having a marginal edge spaced above said closed liner to form a venturi opening to said grinding chamber;

a material feeder connected into said mill base frame to open centrally of said grinding chamber between said pair of side walls and adjacent said venturi opening of said scroll liner, said material feeder cooperating with said material grinding elements in said grinding chamber to cause material in said grinding chamber to progressively move axially and emerge at said axially spaced openings adjacent said pair of side walls;

a mill superstructure on said base frame providing a drying air inlet plenum in communication with said grinding chamber at said scroll liner venturi opening, and with ground material emerging at said axially spaced openings;

an expansion chamber in said mill superstructure in position to receive ground material air moved from said grinding chamber and positioned to generally direct air and ground material away from said grinding chamber; and

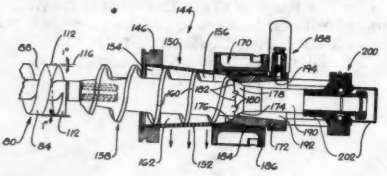
ground material classifying means communicating with said expansion chamber for returning oversize material for passage back to said grinding chamber through said venturi inlet opening along with the drying medium.

4,566,640

SEPARATING MACHINE HAVING OVERLAPPING SCREW PUMP

Archie R. McFarland, Salt Lake City, and Bruce L. Preece, Taylor, both of Utah, assignors to Beehive Machinery, Inc., Sandy, Utah

Filed Jan. 18, 1984, Ser. No. 572,155
Int. Cl.[4] B02C *19/12, 19/22*
U.S. Cl. 241—74 **22 Claims**



1. A deboning machine for receiving pieces of bony meat or fish and for separating meat and other soft components from bone and other relatively hard components of such pieces, said machine comprising

a hopper for receiving the pieces of meat or fish,

said hopper having an exit opening,

a pair of overlapping oppositely rotating feed screws for feeding such pieces out of said hopper and into said opening,

a pump casing connected to said hopper and having overlapping pump bores with entrance ends connecting with said exit opening,

said pump bores also having exit ends,

said pump casing otherwise being substantially imperforate,

a pair of overlapping oppositely rotating pump screws rotatably received in said pump bores for pumping said pieces along said bores between said entrance and exit ends thereof to develop pumping pressure,

said pump screws connecting coaxially with said feed screws,

drive means for driving said feed screws and said pump screws in opposite directions of rotation,

said pump screws having close clearances with said pump bores and with each other for developing pumping pressure at said exit ends of said pump bores,

a hollow separating casing having an entrance end connecting substantially directly with said exit ends of said pump bores for receiving said pieces therefrom,

said separator casing also having an exit end,

said separator casing having a generally tubular separator screen disposed between said entrance and exit ends of said separator casing,

said screen having a multiplicity of perforations through which meat and other soft components are pressed while said screen retains bones and other hard components,

a pressure auger rotatable in said separator casing and having close clearance with said separator screen for pressing meat and other soft components through said perforations while transporting bone and other hard components past said separator screen to said exit end of said separator casing,

additional driving means for rotating said pressure auger,

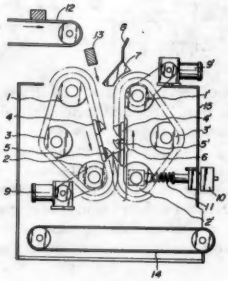
and discharge means at said exit end of said separator casing for discharging the bone and other hard components therefrom while maintaining pressure in said separator casing.

4,566,641

SHEET BREAKING APPARATUS

Magoji Okamoto, Nagoya, and Norio Maekawa, Tokyo, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 18, 1982, Ser. No. 379,477
Claims priority, application Japan, May 22, 1981, 56-76693
Int. Cl.[4] B02C *13/20*
U.S. Cl. 241—200 **2 Claims**



1. A breaking apparatus for cutting and breaking plastic or fibrous sheet materials supplied to said apparatus, comprising;

a pair of endless belt rotating cutting bodies having a plurality of cutting blades fixed respectively thereto;

a first of said pair of rotating cutting bodies being driven in a downward direction, which is a feeding direction for sheet materials to be cut, at a speed faster than a speed of a second of said pair of rotating cutting bodies, said second rotating cutting body being driven in an upward direction, opposite the feeding direction of said sheet materials;

a region of active cutting by said blades comprising a narrow V-shaped region between said pair of rotating cutting bodies, said rotating cutting bodies being arranged such that said cutting blades fixed to said rotating cutting bodies are somewhat separated from each other at upper portions of the region and closely aligned at a lower por-

tion of the region, but laterally spaced from each other so that the cutting blades do not contact one another;

said cutting blades fixed to said first rotating cutting body being arranged in rows extending substantially horizontally across a width of said first rotating cutting body, each row being spaced from its immediately adjacent row by an interval which is substantially equal to an interval that spaces any other row from its immediately adjacent row, each blade contained in a row being spaced from its immediately adjacent blade contained in that row by an interval which is substantially equal to an interval that spaces any other blade contained in any other row from its immediately adjacent blade contained in that same row, and each blade being in alignment with corresponding blades in the circumferentially adjacent rows, all of said blades of said first rotating cutting body being positioned to cut in said downward direction;

said cutting blades fixed to said second rotating cutting body being arranged in rows extending substantially horizontally across a width of said second rotating cutting body, each row on said second rotating cutting body being spaced from its immediately adjacent row by an interval which is substantially one-half of the interval by which each row of said first rotating cutting body is spaced from its immediately adjacent row, each blade contained in a row of said second rotating cutting body being spaced from its immediately adjacent blade contained in that row by an interval which is substantially equal to an interval that spaces any other blade contained in any other row from its immediately adjacent blade contained in that same row, each blade on said second rotating cutting body being in non-alignment with the blades in immediately adjacent rows as viewed in the direction of rotation of said second rotating cutting body, and also each blade being in non-alignment with any blades on the first rotating cutting body, all of said blades of said second rotating cutting body being positioned to cut in said upward direction; and

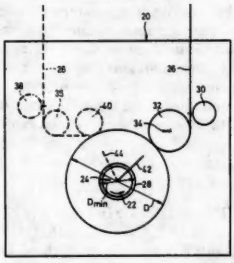
stationary cutting blades arranged above said second rotating body and aligned with said cutting blades of said second rotating cutting body to cut said sheet materials without contacting said cutting blades of said second rotating cutting body.

4,566,642

METHOD AND APPARATUS FOR MONITORING CHUCK OVERSPEED

Hans-Jörg Sommer, Zurich; Hansruedi Lamparter, and Maurizio Wermelinger, both of Winterthur, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Dec. 7, 1984, Ser. No. 679,489
Int. Cl.⁴ B65H *63/00*
U.S. Cl. 242—18 R **8 Claims**



1. A method of detecting an overspeed in winding of thread by a chuck-driven winder, comprising the steps of:

producing a first signal which is representative of an instantaneous chuck rotation speed;

producing a second signal which is representative of an instantaneous limit rotational speed for the chuck and which is a function of package diameter;

comparing said first and said second signals; and

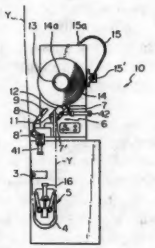
producing a third signal indicating an overspeed condition if the instantaneous chuck rotation speed represented by the first signal exceeds the instantaneous limit rotational speed represented by the second signal.

4,566,643

YARN FEEDING MEANS AND A YARN WINDER INCLUDING THE SAME

Katsumi Hasegawa, and Hiromitsu Kanamori, both of Kusatsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,180
Claims priority, application Japan, May 2, 1983, 58-76283
Int. Cl.⁴ B65H *54/02*
U.S. Cl. 242—18 R **12 Claims**



1. A yarn winder for taking up a yarn continuously fed from a supply source onto a yarn package, comprising

(a) a yarn winding means which comprises

(a-1) a bobbin supporting means including at least a spindle for rotatably supporting a bobbin on which a yarn package is formed,

(a-2) a yarn traversing means for reciprocatingly guiding the yarn in the direction of the axis of said spindle,

(a-3) a means for rotating the bobbin, and

(b) a yarn feeding means which comprises

(b-1) at least a positively rotating feed roller for receiving the yarn moving from said supply source and feeding the received yarn in the direction toward the bobbin by bringing the yarn into contact with a partial periphery of said feed roller;

said feed roller being provided in a position below said yarn traversing means to receive the yarn coming down from said supply source, and

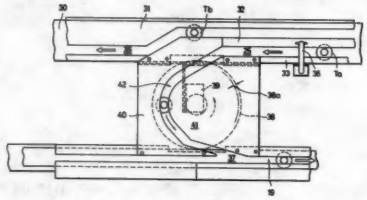
(b-2) a yarn detaching guide positioned in the vicinity of said feed roller and capable of selectively occupying either of two positions, one being a first position where said yarn detaching guide is disengageable from the yarn causing the yarn to pass around said feed roller while touching at least a part of the periphery of said feed roller and the other being a second position where said yarn detaching guide is engageable with the yarn to competely detach the yarn passing thereby from said feed roller.

4,566,644

SYSTEM FOR SUPPLYING VARIOUS KINDS OF COPS TO WINDER

Masaharu Kiriake, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 20, 1983, Ser. No. 543,780
Claims priority, application Japan, Oct. 26, 1982, 57-188459
Int. Cl.[4] B65H *54/20, 67/06*
U.S. Cl. 242—35.5 A 20 Claims



1. A system for supplying various kinds of cops to a winder, said system comprising:

an automatic winder having a multiplicity of winding units;

a cop feeding means for conveying cops to said multiplicity of winding units, said cop feeding means defining a cop feeding passage and being disposed on one side of said winding units while extending along said winding units;

a bobbin ejecting means for conveying unwound bobbins away from said winding units, said bobbin ejecting means defining a bobbin ejecting passage and being disposed on the other side of said winding units while extending along said winding units; and

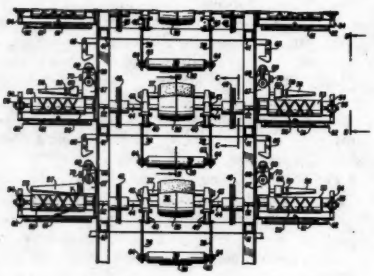
dividing devices provided in said cop feeding passage and said bobbin ejecting passage, said dividing devices dividing said cop feeding passage and said bobbin ejecting passage into at least two passages at any desired positions along said winding units to permit the cop feeding means and bobbin ejecting means to convey cops to and from different wind-up sections comprised of one or more winding units, thereby making it possible to change the numbers of said winding units in each wind-up section.

4,566,645

APPARATUS FOR WINDING YARN

Julius Hermes, Martinsville, Va., assignor to Martin Processing, Inc., Martinsville, Va.

Continuation of Ser. No. 482,984, Apr. 7, 1983, abandoned. This application Feb. 20, 1985, Ser. No. 702,446
Int. Cl.[4] B65H *54/20, 59/00*
U.S. Cl. 242—35.5 R 13 Claims



1. An apparatus for winding a thread of yarn onto a spool comprising:

a spindle adapted to receive a spool;

a grooved cam roller positioned to rotate said spool received by said spindle and wind yarn on said spool;

a rotatable drive means to rotate said grooved cam roller; and

means for coupling said drive means to said grooved cam roller comprising an eddy current coupling unit arranged so that the rotation of said drive means induces a magnetic flux and causes said grooved cam roller to turn thereby rotating said spool and winding yarn on said spool;

said eddy current coupling unit comprising a first drive plate with a layer of current carrying material; and

a second drive plate with a layer of magnetic material, said drive plates being arranged so that they face each other and define an air gap between said layer of current carrying material and said layer of magnetic material;

said current carrying material comprising copper or aluminum;

said means for coupling further comprising a first shaft connecting said first drive plate and said rotatable drive means, and a second shaft upon which is mounted said second drive plate and said grooved cam roller; and

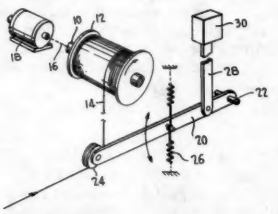
means for moving said second drive plate, said second shaft and said grooved cam roller toward or away from said first drive plate so that the size of said air gap can be varied.

4,566,646

TAKE-UP MACHINE MOTOR CONTROL

Kenneth A. Benjamin, Greensboro, N.C., assignor to Leesona Corporation, Warwick, R.I.

Filed May 11, 1984, Ser. No. 609,113
Int. Cl.[4] B65H *59/38*
U.S. Cl. 242—45 18 Claims



1. In a take-up machine of the type for winding fiber and yarn on spools and tubes with said take-up machine comprising a rotating spindle for receiving tubes and spools, an AC electric motor coupled to said spindle for rotating said spindle, and a tension take-up mechanism for controlling the speed of said electric motor in accordance with tension on fiber and yarn being wound; the improvement comprising said motor having plural windings, said windings being connected to a rectifier circuit, solid state control means for controlling current flow through said rectifier circuit and thereby current flow through each of said motor windings down to zero, said solid state control means including a linearly movable control element connected to said tension take-up mechanism for positioning thereby.

4,566,647

DECORATIVE WINDING METHOD FOR MAGNETIC TAPE OR THE LIKE

Shoji Iwamoto, and Kazuo Kubota, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

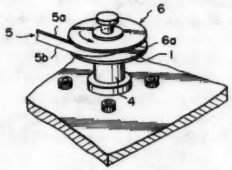
Filed Jul. 23, 1984, Ser. No. 633,335
Claims priority, application Japan, Jul. 26, 1983, 58-136643
Int. Cl.[4] B65H *17/02*
U.S. Cl. 242—67.1 R 4 Claims

1. A decorative winding method for winding a magnetic

tape or the like onto a reel having a lower flange and an integral reel shaft having a free end onto which a transparent flange is secured after the magnetic tape or the like has been wound onto the reel shaft, the method resulting in a flat, even coil of said tape or the like having an attractive, even appearance, the method comprising the steps of:

(i) supporting said lower flange and said reel shaft so that said free end of said reel shaft faces upwards;

(ii) clamping one end of the tape to said reel shaft;



(iii) placing a weighted disc-like cap on the free end of the reel shaft;

(iv) winding up said tape on said reel shaft while said tape is biased downward against the lower flange by the weight of said cap;

(v) removing said cap; and

(vi) thereafter securing said upper flange to said free end of said reel shaft to complete the tape reel.

4,566,648

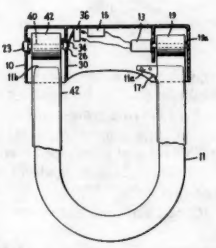
DEVICE FOR APPLYING AND CONVEYING A PROTECTIVE COVER FOR A TOILET SEAT

Dipl.-Ing. B. Hefty, Beckenried, and Arpad Hefty, Richenthal, both of Switzerland, assignors to Hygolet AG, Hergiswil, Switzerland

Filed Oct. 3, 1984, Ser. No. 657,324

Int. Cl.[4] A47K *13/14, 13/20, 10/38*

U.S. Cl. 242—67.3 R **14 Claims**



1. A device for applying and conveying a hose-shaped protective covering for a toilet seat, the device having a housing containing an unwinding spool, from which the protective covering is drawn off, and a take-up spool, a battery-operated electro motor operatively connected to the take-up spool, the protective covering being rolled up on the take-up spool after use, a push button protruding laterally from the housing on the side of the unwinding spool, a switch opposite the unwinding spool operatively connected to the electro motor, the improvement comprising means for actuating said switch comprising a switch tube axially moveable in the housing, the unwinding spool being rotatable and axially movable on the switch tube, said push button engageable with said switch tube for moving said switch tube axially to actuate said switch.

4,566,649

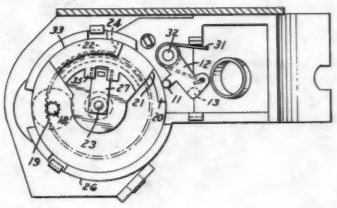
CONVERSION CONTROL FOR COMBINATION VSI AND ALR RETRACTOR

Carl M. Petersen, III, Drayton Plains, Mich., assignor to Irvin Industries Inc., Rochester Hills, Mich.

Filed Jun. 25, 1984, Ser. No. 624,228

Int. Cl.[4] B60R *22/36;* B65H *75/48*

U.S. Cl. 242—107.4 A **6 Claims**



1. Combination vehicle sensitive inertia, and automatic locking retractor, comprising a vehicle sensitive inertia retractor having spring wind-up webbing reel means with a ratchet and a latch bar normally actuated by inertia means for locking the reel means against webbing extraction, and supplemental means biasing the latch bar toward extraction locking ratchet engagement in response to full webbing exrtraction beyond occupant restraining position to cause said retractor upon webbing ratcheting spring wind-up to a passenger restraining position to automatically lock in an automatic locking retractor mode without inertia actuation, said supplemental means including gearing responsive to reel rotation for sensing full webbing extraction and retraction, a projection from said gearing operative at the extremity of webbing extraction to retain the vehicle sensitive inertia mode of operation until a predetermined amount of reverse actuation of said gearing moves said projection to an inoperative position, thereby delaying transfer to automatic locking retractor mode during a slight retraction of webbing from full extension, and means for restoring normal vehicle sensitive inertia operation upon full belt retraction beyond occupant restraining position, where, in the combination, pivoted slide means actuated by said projection establishes the prevailing vehicle sensitive inertia and automatic locking retractor modes of operation, said pivoted slide means including an arcuate segment actuated in either clockwise or counter-clockwise direction by said projection at the extremities of gearing travel corresponding to webbing extraction and retraction, means within a predetermined range of travel of said segment for establishing said vehicle sensitive inertia mode of operation, and means operative when said segment is outside of said predetermined range of travel for extablishing said automatic locking retractor mode of operation, said projection having mounting means allowing lost motion travel between extremities where it engages said segment.

4,566,650

EMERGENCY-LOCKING TYPE RETRACTOR PROVIDED WITH A TAKE-UP FORCE LOCKING MECHANISM

Masaru Morinaga, Yamato, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,131

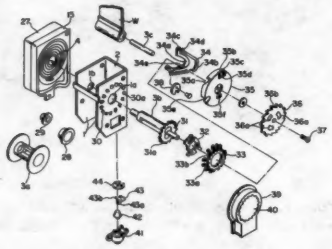
Claims priority, application Japan, Jul. 30, 1982, 57-114735[U]

Int. Cl.[4] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **3 Claims**

1. A retractor having reel shaft means biased in a belt take-up direction and rotatably supported by a base member, a belt take-up force locking mechanism capable of assuming an initial operative position in which the rotation of said reel shaft means

in the belt take-up direction is prevented while rotation of said reel shaft means in a belt draw-out direction is allowed, the reel shaft means tending to rotate in the belt draw-out direction in reaction to return of the belt take-up force locking mechanism to its initial operative position after it has been moved from its initial operative position by the rotation of the reel shaft means in the belt draw-out direction, an emergency-locking mechanism for sensing at least one of a draw-out speed change of the belt above a predetermined value and a vehicle speed change above a predetermined value and for connecting said reel shaft



means to said base member to prevent the rotation of said reel shaft means in the belt draw-out direction, said emergency-locking mechanism including a first means which moves due to its inertia upon said return of the belt take-up force locking mechanism to its initial operative position, and a second means responsive to said movement of said first means for attempting to connect the reel shaft means to the base member, and means for preventing said second means from connecting the reel shaft means to the base member upon said return of the take-up force locking mechanism to its initial operative position.

4,566,651

ASSEMBLY OF A SUPPORT AND THREAD TENSIONERS FOR A BOBBIN CREEL

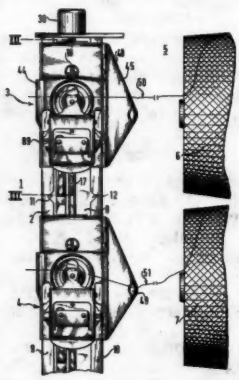
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,366

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228282

Int. Cl.[4] B65H *59/22*

U.S. Cl. 242—150 R **42 Claims**



1. Assembly for a bobbin creel comprising a rod-shaped support and thread tensioners connected to the support, said support being a rod with a hollow profile and formed with a longitudinal slot; each of said thread tensioners having a drive unit, a loading unit and at least one cut-type thread break; said cut-type thread brake being formed of a plurality of cups having a substantially horizontal axis of rotation; means for connecting said drive units, respectively, to at least one of the cups of the respective thread brakes for rotating said one cup; said drive units of said thread tensioners being disposed in the interior of said rod with said hollow profile; a common drive element connecting said drive units to one another; said loading unit having means engageable with said thread brake for tensioning a thread extending through the respective thread tensioner; and a releasable clamping element connecting said cup-type thread brake to said support, said drive unit having a support body with forward-directed discontinuities of the surface thereof; said cup-type thread brake having a support body with rearwardly-directed surface discontinuities; said surface discontinuities of said two support bodies engaging one another in a positively locking and releasable manner.

4,566,652

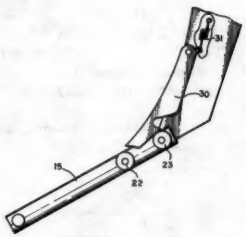
TAPE DRIVE HAVING SWING ARM BUFFERS AND AUTOMATIC THREADING

Ronald Permut, Boulder County, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 18, 1983, Ser. No. 553,481

Int. Cl.[4] G11B *15/32, 15/66;* B65H *17/02, 17/32*

U.S. Cl. 242—189 **8 Claims**



1. A magnetic tape drive of the type in which magnetic tape is driven past a magnetic read/write head between a machine reel and a file reel by a capstan comprising:

first and second pivoted swing arms respectively positioned between said file reel and said capstan and between said machine reel and said capstan and respectively biased away from said file reel;

fixed rollers positioned adjacent each of said first and second swing arms;

a pair of rollers on each of said swing arms, said tape passing between a fixed roller and the pair of rollers on the adjacent swing arm so that the bias on said first and second swing arms respectively decouple the inertia of tape on said file and machine reels from said capstan;

pneumatic means for transporting tape along a path between said file reel and said machine reel for automatically threading tape;

first and second members respectively connected to said first and second swing arms, said members being movable to retract said swing arms toward said file and machine reels and out of said path during threading; and

a pivoted deflector adjacent one of said swing arms, said deflector being movable to a position between the pair of fixed rollers on said swing arm to prevent tape from passing between said pair of rollers during threading.

4,566,653

TAPE CASSETTE COMPRISING A SUBSTANTIALLY RECTANGULAR TWO-PART HOUSING

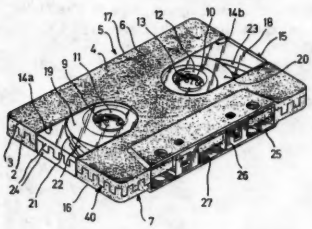
Guenter Bettinger, Schifferstadt; Dietmar Pfefferkorn, Hemsbach, and Bozidar Pavelka, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 543,061

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 8229387[U]

Int. Cl.[4] G03B *1/04;* G11B *15/32*

U.S. Cl. 242—199 2 Claims



1. A magnetic tape cassette comprising at least one magnetic tape roll within an essentially right parallelpipedic, two-part housing consisting of a cover part and a bottom part which together have a bottom wall, a top wall, a front wall with apertures for scanning, and side walls and a rear wall, the front wall, the rear wall and the side walls consisting of wall sections which are at right angles to the bottom and top walls and abut one another in a substantially horizontal parting plane of said housing, said wall sections having interlocking connecting means,

wherein as connecting means on the side surfaces of at least the wall sections forming the rear wall there are provided a series of teeth on each of the bottom part and the cover part, said teeth being integral with said sections, whereby in the closed housing each tooth on one of said wall sections is engaged in an opposite matching recess on the opposite wall section, said teeth and recesses being in the form of prism-shaped projections which are triangular in cross-section, and matching recesses, the inclined side of the triangle being at an angle to the plane of the tape cassette, and

wherein the end faces of both the teeth and the matching recesses are disposed in horizontal planes oppositely spaced from the horizontal parting plane of the housing so that straightthrough communicaton in any of said horizontal planes at the location of said teeth and recesses is avoided.

4,566,654

WEB TRANSPORT DEVICE

Masami Maetani, Ohmiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,440

Claims priority, application Japan, Jul. 28, 1983, 58-138166; Jul. 28, 1983, 58-138167; Jul. 28, 1983, 58-138168; Jul. 28, 1983, 58-138169; Jul. 28, 1983, 58-138170

Int. Cl.[4] G03B *1/04;* G11B *15/32*

U.S. Cl. 242—204 18 Claims

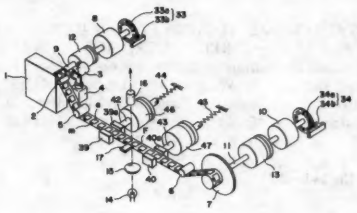
1. A web transport device for transporting a web wound on a supply shaft to a take-up shaft, comprising:

drive means for rotating said take-up shaft for transporting the web to said take-up shaft;

first brake means for stopping rotation of said supply shaft;

second brake means for stopping rotation of said take-up shaft; and

brake control means for controlling said first brake means and said second brake means, wherein said brake control means operates both said first and second brake means, thereafter renders said first brake brake means inoperative for a predetermined time and then operates said first brake means again, so that the web can be stopped while providing slack in the web between said supply shaft and said take-up shaft.



4,566,655

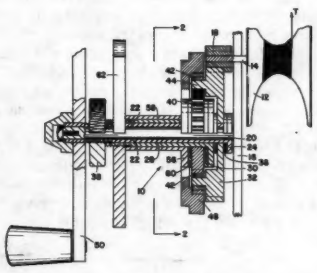
TWO-SPEED DRIVE FOR A FISHING REEL

John N. Young, Fairfax, Calif., assignor to Charles C. Worth Corporation, Kentfield, Calif.

Filed Nov. 9, 1984, Ser. No. 670,022

Int. Cl.[4] A01K *89/015*

U.S. Cl. 242—215 7 Claims



1. A two-speed drive for a fishing reel comprising:

a frame;

a first shaft rotatable on said frame;

a first clutch collar on said first shaft;

a drive shaft slidable on said first shaft and keyed thereto to rotate therewith;

a second clutch collar on said drive shaft;

a main drive gear rotatable between said first and second clutch collars;

high speed clutch adjustment means for moving said first and drive shafts axially relative to each other to squeeze said main drive gear between said first and second collars so that said first and second collars form a high speed, low drag clutch;

a secondary drive gear driven by said drive shaft;

at least one planetary gear rotatably carried on one side of said main drive gear and meshing with said secondary drive gear; and

a ring gear surrounding and engaged by said planetary gear;

said ring gear being rotatable on said frame;

interengaging means on said ring gear and said frame enabling rotation of said ring gear in one direction only to rotate with said main drive gear when said high speed, low drag clutch is effective; and

an output pinion driven by said main drive gear, directly from said drive shaft at high speed ratio when said high

speed clutch is effective, and through said secondary drive gear at high power ratio when said high speed clutch is overcome.

4,566,656

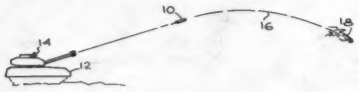
STEERING MECHANISM FOR AN EXPLOSIVELY FIRED PROJECTILE

Inge Maudal, Huntington Beach; Byron M. Niemeier, Claremont, and Larry D. Wedertz, Mira Loma, all of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Division of Ser. No. 418,142, Sep. 15, 1982. This application Mar. 6, 1984, Ser. No. 586,740

Int. Cl.[4] F41G *7/30*

U.S. Cl. 244—3.11 **8 Claims**



1. A system for correcting the trajectory of a projectile while in flight, the projectile being propelled by a powder charge fired from a cartridge shell in a gun at a ground position, the system comprising:

means remote from the projectile for sensing the position of the projectile in flight;

said remote means including:

(a) means responsive to said sensing means for determining the correct trajectory for said projectile and generating command signals for controlling the projectile to follow said correct trajectory; and

(b) means for transmitting said command signals to an antenna mounted to said projectile; and

means coupled to the antenna for generating signals in response to said command signals to cause an elongated member extending rearwardly from said projectile to deflect off-axis in the air stream interacting therewith, said elongated member extending into said powder charge prior to firing and being selectively deflectable relative to the longitudinal axis of the projectile in response to said generated signals, thereby steering said projectile to the correct trajectory.

4,566,657

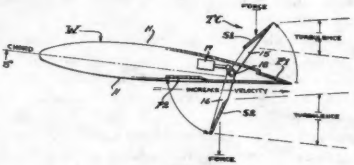
SPAN LOADED FLYING WING CONTROL

Harlow B. Grow, 16530 Chattanooga Pl., Pacific Palisades, Calif. 90272

Continuation of Ser. No. 40,663, May 21, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,517

Int. Cl.[4] B64C *9/20, 9/32, 9/00*

U.S. Cl. 244—90 A **14 Claims**



1. A flying wing aircraft control for inducing angle of attack and controlling the line of flight, and including;

a wing having upper and lower cambered surfaces and a center of lift substantially forward of a trailing edge establishing a moment arm therebetween,

upper and lower trailing edge pitch control surfaces aft of the center of lift and retractile substantially coincidental with the upper and lower cambered surfaces of the wing,

lever means to space said upper and lower pitch control surfaces into the air stream above and below said upper and lower cambered surfaces of the wing and inclined upwardly with respect to the air stream continuing to flow over and under the wing for reaction downwardly at the trailing edge of the wing,

and means positioning the lever means to extend and retract said pitch control surfaces for adjusting the downward force reaction on said moment arm and resultant pitch control of the flying wing aircraft.

4,566,658

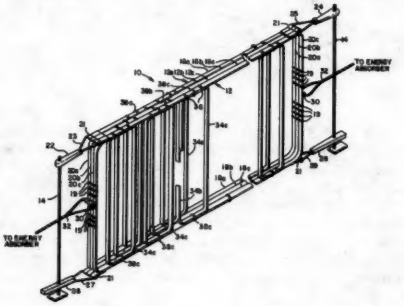
AIRCRAFT BARRICADE

Perry R. DiGiovanniantonio, Philadelphia, and William J. Zimmer, Morton, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 1, 1983, Ser. No. 519,421

Int. Cl.[4] B64F *1/02*

U.S. Cl. 244—110 R **12 Claims**



1. A webbing system for arresting the forward motion of a landing aircraft comprising:

a plurality of first rectangular loops juxtaposed in substantially parallel planes and adapted to be extended substantially vertically across the path of the aircraft; and

a plurality of second rectangular loops arranged within said first rectangular loops in alternating transverse rows substantially coplanar with the respective planes of said first loops, said second loops being slidably connected to respective ones of said first loops to permit a lateral movement along the entire length thereof and equalize loading on the aircraft's wings, said second loops furthermore positioned side-by-side in the transverse rows, those in alternate rows being substantially aligned with each other and those in adjacent rows being laterally offset from each other by approximately one-half the width of said loops.

4,566,659

PIVOTABLE SUPPORT RESCUE HOIST

John C. Luckachina, Shelton, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1984, Ser. No. 662,122

Int. Cl.[4] B64C *1/22;* B64D *9/00*

U.S. Cl. 244—137 R **2 Claims**

1. A support structure for pivotably mounting a rescue hoist on the main structure of a helicopter, comprising:

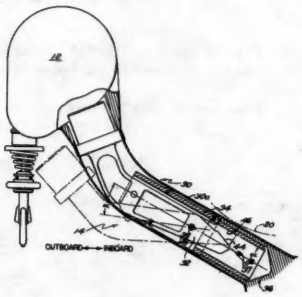
an airframe flange, fixedly attached to said main structure, for providing a cylindrical mounting protrusion for said support structure;

a support member, fixedly attached to said airframe flange, said support member having a male cylindrical protrusion on one end thereof and a channel shaped protrusion on the opposite end thereof, said male protrusion being slidably engaged within said mounting flange protrusion and ori-

ented such that said channel shaped protrusion opens generally downward;

a first fastening means, attached through said male protrusion and said mounting flange protrusion, for fixedly connecting them together;

a support arm, pivotably attached to said support member within said channel protrusion, for permitting said arm to swing in a vertical plane through an arc of predetermined angle α;



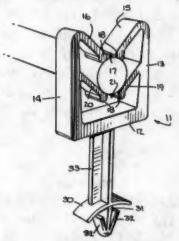
a second fastening means, connecting said support arm to said support member channel protrusion, for providing a pivot member for said support arm; and a third fastening means, connecting said support arm to said support member channel protrusion when said support arm is in its full upright position, for supporting and securing, in conjunction with said second fastening means, said rescue hoist in its operable position.

4,566,660

CRADLE CLIP

Joseph Anscher, Farmingdale, N.Y., and Dale Smous, Coral Springs, Fla., assignors to National Molding Corporation, Farmingdale, N.Y.

Filed Jan. 20, 1983, Ser. No. 459,595
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.2 **14 Claims**



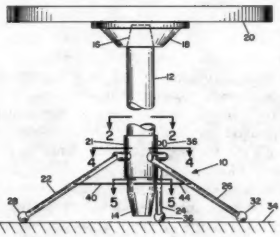
1. A conduit restraining clip comprising: a base, two side walls projecting generally vertically from the opposite edges of the base and defining with said base a generally U-shaped enclosure, two lower arms projecting, one from each of said side walls, in the direction of the opposite wall and diagonally downward toward the base, and two upper arms projecting, one from each of said side walls, in the direction of the opposite wall and diagonally downward toward the base, each of said upper arms being spaced along its length from its lower arm counterpart which projects from the same wall, the distal ends of said upper arms extending to positions juxtaposed from and closely adjacent to each other thereby defining a gap therebetween, the distal ends of said lower arms extending to positions juxtaposed from and closely adjacent to each other thereby defining a gap therebetween, said upper arms being adapted to resiliently flex downwardly and toward the side walls of the clip to enable the passage of a conduit between said upper arms into the clip enclosure and to resiliently return to substantially their unstressed positions when the conduit has passed into the clip, said lower arms being adapted to resiliently flex downwardly and toward the side walls of the clip to enable the clip to receive a conduit and to resiliently seek their unstressed positions thereby urging a conduit within the clip toward said upper arms so that a conduit once inserted into the clip is held between said upper and lower arms which upper and lower arms are adapted to flex to absorb movements of a conduit inserted into the clip.

4,566,661

FOLDING TABLE SUPPORT

Donald C. Mestler, 5 Potter Ct., Smithtown, N.Y. 11787

Filed Jul. 31, 1984, Ser. No. 636,306
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—171 **12 Claims**



1. Support apparatus for use with a table arrangement including a table-top having a tapered receiving socket mounted on one side and a cylindrical table support tube having tapered ends for insertion into said table-top socket and another socket, comprising a cylindrical collar having an axis and a central axial bore arranged to surround said tube, said collar having means for engaging said tube to selectively axially fix said collar on said tube, at least three support legs, extending radially from said collar and pivotably mounted thereto by pivot axes which are circumferential with respect to said collar axis to fold in planes which are tangential to said tubes, and at least three support struts arranged for pivotal connection to said tube and to said legs at a selected position between said collar and the radially outer ends of said legs for limiting the outward pivoting of said legs.

4,566,662

BATH ACCESSORIES, AND DECORATIVE WALL FLANGES THEREOF

Yoshinori Toshishige, Tokyo, Japan, assignor to Reliance Incorporated, Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,923
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—222.1 **1 Claim**

1. A bathroom accessory, comprising the combination of

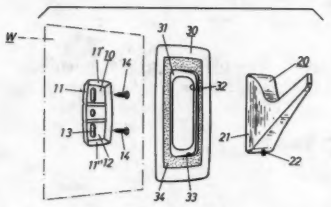
a generally boat-shaped wall plate having a plane bottom wall one surface of which is disposed to be fixed against a bathroom wall, and the other surface of which has projecting therefrom an integral side wall which surrounds said bottom wall and diverges outwardly therefrom,

a fixture having a generally rectangular base disposed to be fixed at one end to said wall plate, and having projecting from its opposite end an integral projection engagable with an article releasably to support the latter on said fixture, said base having in said one end thereof a substantially rectangular recess surrounded by a shoulder of such

dimension as to allow said recess concealingly to accommodate therein said boat-shaped wall plate,

fastening means disposed to act between said shoulder and said side wall of the wall plate for removably securing said fixture fixedly to said wall plate, and

a generally flat, decorative wall flange having therethrough a central opening similar in configuration to and larger than the outer peripheral dimension of said wall plate, and having in one surface thereof a recessed area of substantially rectangular shape, and a decorative plate secured in and and covering part of said area and having therethrough a central opening which corresponds in configu-



ration to the circumferential outer periphery of said shoulder on said fixture base, and which forms in said wall flange an internal shoulder that is spaced outwardly from and surrounds said central opening in said wall flange,

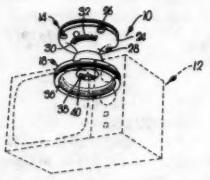
said wall flange being disposed to be inserted over said wall plate with the surface thereof opposite its recessed area being seated against the wall on which said wall plate is fixed, and with said shoulder on said base being positioned in said central opening in said decorative plate and seated securely against the remaining portion of said recessed area in the wall flange, thereby to secure said wall flange in proper orientation with respect to said fixture.

4,566,663

OVERHEAD PIVOTAL MOUNTING ASSEMBLY FOR TELEVISION SET

David D. Barchus, 4406 NE. 49th Ter., Kansas City, Mo. 64119, assignor to David Duane Barchus, Kansas City, Mo.

Filed Mar. 29, 1984, Ser. No. 594,998
Int. Cl.[4] F16M *11/14*
U.S. Cl. 248—324 **2 Claims**



1. An article mount comprising:

a first bracket having a socket;

a second bracket having a ball in said socket, presenting a ball-and-socket joint between the brackets,

said ball and said first bracket having normal relative movement in a plurality of directions, permitting relative swinging movement of said first bracket and said second bracket to and from any one of a number of preselected positions;

a threaded bolt associated with said ball and said socket;

a nut threadably engaging said bolt for releasably clamping said first bracket and said second bracket in any one of said positions;

an elongated handle coupled to said nut for selective tightening of the latter, said handle being swingable in an arc to turn said nut about said bolt; and

an elongated channel associated with said second bracket,

said channel having a plurality of spaced, aligned teeth extending transversely therein,

a portion of said handle being movable longitudinally of said channel for turning said nut about said bolt,

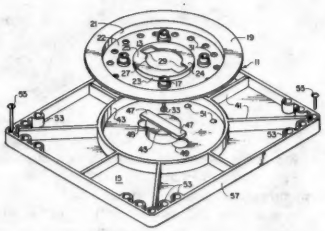
said portion of said handle also being movable toward a position between an adjacent pair of said teeth such that the latter precludes rotation of said nut relative to said bolt.

4,566,664

ROTATABLE MOUNTING UNIT

Jimmie W. Donald, O. W. Donald Co., 2800 N. 50th, Fort Smith, Ark. 72904

Filed Jun. 4, 1984, Ser. No. 617,062
Int. Cl.[4] A47B *49/00*
U.S. Cl. 248—349 **18 Claims**



1. A rotatable mounting unit for a cabinet or box comprising

a base having a cylindrical projection comprising a recessed portion forming a flange with an opening in the center thereof,

a plurality of equally spaced first detent elements around the top of said projection,

at least one notch extending outwardly into said flange,

a mounting platform having a circular rim thereon forming a recess to receive said projection, and

a post having at least one lug extending radially therefrom which aligns with and passes into said notch for one rotational relation of said base and platform causing said lug to engage said flange and couple said platform to said base,

said lug being positioned on said post so that it does not extend entirely through said notch and is resiliently deformable to pass out of said notch and onto said flange,

said platform having a plurality of second detent elements located to match with said first detent elements for at least six relative rotational positions of said base and said platform.

4,566,665

ADJUSTABLE HANGER

Fred L. Rynearson, 111 N. State, Decatur, Tex. 76234

Continuation of Ser. No. 344,368, Feb. 1, 1982. This application Jul. 23, 1984, Ser. No. 632,692
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—495 **1 Claim**

1. An adjustable hanger for mounting a picture or the like to a generally vertical mounting surface, the picture or the like having a flexible support line, comprising:

a body comprising a rear wall having spaced first and second walls at first and second ends respectively extending outward from one side of said rear wall,

said body being adapted to be secured to the mounting surface with said first and second walls extending outward therefrom,

aligned apertures formed through said first and second walls respectively,

a slide member having a threaded aperture formed therethrough,

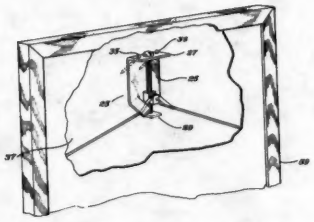
an elongated threaded member extending through said apertures formed through said first and second walls and threaded through said threaded aperture formed through said slide member such that upon rotation of said elongated threaded member, said slide member engages said body and moves between said first and second walls,

said slide member comprising holding means for receiving the flexible support line of a picture or the like,

said rear wall near said second end being formed into first and second members located on opposite sides of a central end portion with said second wall extending outward from said central end portion at said second end,

said first and second members having outer edges and inner edges,

said first and second members extending outwardly from said one side of said rear wall from first and second positions respectively between said first and second ends,



said first and second members extending obliquely outwardly from said rear wall such that said first and second members define acute angles respectively relative to said central end portion of said rear wall,

said inner edges of said first and second members being located closer to said first end than said outer edges respectively of said first and second members,

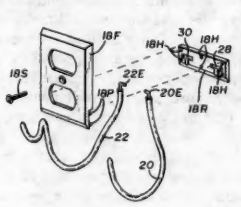
said inner edges of said first and second members and said central portion of said rear wall near said second end forming two slots respectively for receiving the flexible support line of a picture or the like whereby when said elongated threaded member is rotated in a direction to move said sliding member toward said first wall, the flexible support line of a picture or the like when received by said holding means of said slide member and in said two slots, is moved through said two slots toward said first wall.

4,566,666

SMALL APPLIANCE WALL BRACKET

Robert J. Meska, and Mary F. Bishop, both of P.O. Box 21, Michigan City, Ind. 46360

Filed Jun. 1, 1984, Ser. No. 616,075
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—558 **12 Claims**



1. A wall bracket kit for holding any one of a large number of small electrical appliances such as a hair dryer, of different configurations, comprising:

a base that is securable to a wall;

a first and a second elongated support member, each of which has two ends, and one end securable to said base; and

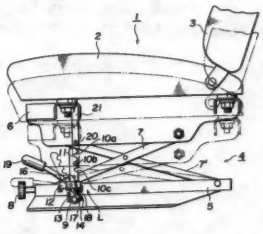
said elongated members being formed of a malleable material that is malleable enough to be hand-formed into a desired contour to conformly receive a particular small appliance, but stiff enough to hold that shape and the appliance without material deformation.

4,566,667

SEAT SUSPENSION

Hiroshi Yanagisawa, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,682
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—561 **3 Claims**



1. A seat suspension including a base frame adapted to being fixed to a vehicle floor, a movable frame, mounting means for mounting said movable frame for vertical movement between raised and lowered positions, relative to said base frame, and lock means operatively disposed between said base frame and said movable frame for locking said base frame to said movable frame to thus prevent vertical movement thereof, wherein said lock means includes:

a lock piece provided in one frame of said movable and base frames;

a lock pin provided in the other frame of said movable and base frames;

means defining at least one lock recess in said lock piece to establish said lowered position of said movable frame and engageable with said lock pin to lock said movable frame to said base frame at said lowered position;

coupling means for coupling said lock piece to said one frame for pivotal movements between (a) a disengaged position wherein said lock recess and lock pin are disengaged from one another to permit said vertical movement of said movable frame and (b) an engaged position wherein said lock recess and said lock pin are engageable with one another to prevent said vertical movement of said movable frame;

manually-operated handle means connected to said lock piece for permitting manual movement of said lock piece between said engaged and disengaged positions;

said coupling means including biasing means for biasing said lock piece in a first rotational direction to releasably maintain said lock piece in said disengaged position and a second rotational direction, opposite to said first rotational direction, to assist in pivotal movement of said lock piece from said disengaged position and into said engaged position; wherein

an upper end of said lock piece includes means defining an inclined surface slidably engageable with said lock pin when said lock piece is in said engaged position, said inclined surface-defining means for pivoting said lock piece from said engaged position, in said first rotational

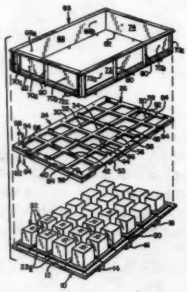
direction towards said disengaged position, in response to said lock pin being slidably engaged therewith when said movable frame is downwardly vertically moved from said raised position and towards said lowered position, said biasing means thereafter causing said lock piece to be pivotally moved, in said second pivotal direction, back into said engaged position when said lock pin and said lock recess are in registry with one another thereby causing said lock pin and said lock recess to be engaged with one another.

4,566,668

APPARATUS FOR CASTING CONCRETE

Bruce G. Koppenberg, 9674 Mt. Baker Hwy., Deming, Wash. 98244

Filed Mar. 29, 1984, Ser. No. 594,539
Int. Cl.[4] B28B 7/18, 7/28
U.S. Cl. 249—60 5 Claims



1. Apparatus for casting concrete comprising

a platform element adapted to be supported on the ground having a work-supporting essential non-perforate upper face,

plural box-like molds each having a top, sides and a base, said molds being distributed over said platform element with their bases facing against said upper face of said platform element,

a lattice frame paralleling and supported by the platform element comprising a planar element with plural openings extending therethrough, each opening snugly receiving bottom margins of the sides of a mold, said lattice frame further positioning said molds on the platform element, each mold comprising a tub mold having a perimeter flange adjacent its base integral with the sides of the mold and projecting outwardly from the mold sides, said flange disposed between the lattice frame and the platform element, and

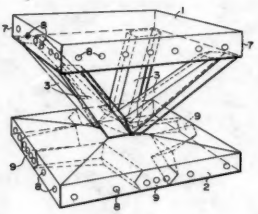
a knockdown encompassing frame with sides extending upwardly from adjacent the periphery of said lattice frame, said encompassing frame overlying said lattice frame around the periphery of the lattice frame, and clamps securing the encompassing frame, the lattice frame, and the platform element together, thereby establishing a concrete-leakage inhibiting seal between said lattice frame and the encompassing frame and between the base of the tub molds and the lattice frame.

4,566,669

MOLD FOR CASTING REINFORCED CONCRETE PANEL ASSEMBLY ELEMENTS

Josef Rottmayr, Munich, Fed. Rep. of Germany, assignor to Aloisius Assmann, Enger, Fed. Rep. of Germany, a part interest

Continuation-in-part of Ser. No. 552,854, Nov. 17, 1983, which is a continuation of Ser. No. 291,803, Aug. 10, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,604
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031868
Int. Cl.[4] B28B 7/20
U.S. Cl. 249—160 4 Claims



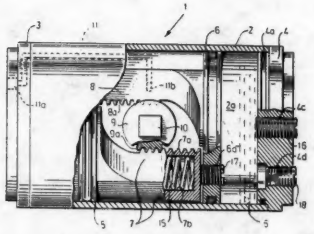
1. A mold system for casting a one piece three-dimensional assembly element for steel reinforced concrete truss-work panels including upper and lower chords extending in two planes which are parallel to each other in space, said upper and lower chords being interconnected by three, four or six struts which form a single junction in the center of one of the chords and fan out toward an edge zone of the other of said chords, comprising a substantially horizontally extending flat support surface (19) and means for forming a mold cavity on said flat support surface (19), said mold cavity forming means consisting exclusively of a plurality of mold sections corresponding in number to the number of said struts, means for moving said mold sections in parallel to said flat support surface, each strut having such a cross-sectional shape that it is free of any back taper for permitting a free substantially horizontal opening movement of said mold sections, said mold sections comprising first wall means forming separation surfaces enclosing the same angle as the directions of the struts projected into a horizontal plane defined by said flat support surface, said first wall means enclosing strut cavities therein for defining said struts, said first wall means having wall sections without any back tapers therein and extending only in directions permitting a withdrawal movement of the respective mold section in parallel to said flat support surface, said mold sections forming an open bottom closed by said flat support surface (19) and an open top for pouring a concrete mix into said mold and for screeding off excess concrete mix, and wherein said mold sections comprise second wall means defining an upwardly open upper chord mold cavity (23) for molding an upper chord, third wall means defining a downwardly open lower chord mold cavity (24) for molding a lower chord, said first wall means (16) enclosing said strut cavities (21) so that said strut cavities operatively interconnect said upper and lower chord mold cavities for filling both chord mold cavities and said strut cavities substantially simultaneously, whereby it is possible to cast the upper chord, the lower chord and all struts as a one piece unit which, upon hardening of the concrete mix, remains standing on said flat support surface (19) when said mold sections are moved substantially horizontally away from each other.

4,566,670

FLUID PRESSURE ACTUATOR HAVING POSITION SETTING MEANS

Sven Nordlund, Vällingby, Sweden, assignor to Wm Regele AB, Vällingby, Sweden

PCT No. PCT/SE84/00049, § 371 Date Sep. 19, 1984, § 102(e) Date Sep. 19, 1984, PCT Pub. No. WO84/03129, PCT Pub. Date Aug. 16, 1984
PCT Filed Feb. 10, 1984, Ser. No. 653,270
Claims priority, application Sweden, Feb. 11, 1983, 8300757
Int. Cl.[4] F16K *21/04*
U.S. Cl. 251—58 3 Claims



1. A fluid pressure actuator comprising:

a cylinder (2) having axially disposed end walls (3, 4), at least one side wall, and an inner chamber (2*a*) bounded longitudinally by said end walls and transversely by said at least one side wall;

first and second pistons (5, 6) located in said inner chamber. said pistons being simultaneously movable in opposite directions along the longitudinal axis of said cylinder in response to fluid pressure introduced into said inner chamber, each of said pistons having a toothed rack portion (7, 8) extending longitudinally toward the interior of the inner chamber;

a toothed wheel (9) having teeth which mesh with the teeth of said toothed rack portions, said toothed wheel being mounted on an actuating member (10) journaled for rotation in a side wall of said cylinder 2;

at least one fluid passage (11) for supplying pressure fluid to said inner chamber (2*a*) between said two pistons to thereby extend said pistons to their respective outer terminal positions;

means for causing said pistons to retract to their fully retracted, zero-position upon release of said pressure fluid from between said two pistons;

first adjusting means (16) passing through at least one of said end walls such that it projects past the end wall into the inner chamber while being accessible from the exterior of the cylinder, for adjusting the maximum outer terminal positions of said pistons;

second adjusting means (17), passing through one of said pistons such that it projects into the inner chamber between said two pistons and into engagement with the toothed rack portion of the other of said pistons, while being accessible from that portion of the inner chamber between said one piston and its juxtaposed end wall, for adjusting the relative positions of said pistons in their fully retracted, zero-position; and

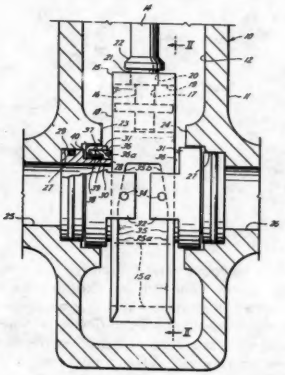
means in the end wall juxtaposed to said one piston for providing access to said second adjusting means without removal of said juxtaposed end wall.

4,566,671

GATE VALVE HAVING A SECONDARY SEAL

John Beson, 1330 Sherwood Forest, #205, Houston, Tex. 77043

Filed Nov. 14, 1983, Ser. No. 551,589
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—159 15 Claims



1. A gate valve, comprising:

(a) a valve body having a valve chamber therein and a pair of flow passages aligned at opposite sides of the valve chamber, and additionally having a recess around the inner end of each of the aligned flow passages;

(b) a gate member having an imperforate section and a section having a flow passage therethrough, the gate member being disposed within the valve chamber and being reciprocably movable along a line substantially transverse to the valve chamber flow passages between a gate position in which the valve is open and the flow passage of the gate member aligns with the valve chamber flow passages and a gate position in which the valve is closed and the imperforate section aligns with the valve chamber flow passages;

(c) a valve seat in each of the recesses around the inner end of the flow passages, at least one of the valve seats comprising a ring-shaped seat against which the gate member slides between the open and closed positions such that the gate forms a primary seal with the ring shaped seat when the gate is in the valve closed position;

(d) a seal support ring slidably disposed around said ring-shaped seat, the seal support ring having an inner recess therearound at the end adjacent the gate;

(e) an elastomeric seal member disposed in the inner recess of the seal support ring; and

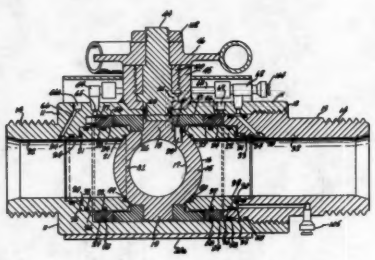
(f) means associated with said seal support ring and said gate for drawing the seal support ring toward the gate when the gate is moved from the valve open position toward the valve closed position to force the elastomeric seal member into sealing engagement with the gate after the gate has reached the closed position to form a secondary seal after the formation of the primary seal, and for moving the seal support ring such that the secondary seal is deenergized prior to substantial movement of the gate across the elastomeric seal member whereby drag and wear of the elastomeric seal member by the gate are minimized upon the movement of the gate to the open position.

4,566,672

PRESSURE BALANCED BALL VALVE

James F. Giebeler, 3655 El Camino Dr., San Bernardino, Calif. 90204

Filed Nov. 9, 1983, Ser. No. 550,485
Int. Cl.[4] F16K 25/00
U.S. Cl. 251—192 6 Claims



1. In a pressure balanced valve assembly, the combination of: a tubular body having a longitudinal axis, a valve member in said body mounted to turn about a transverse axis, a cage mounted for axial movement longitudinally within said body, first and second annular pistons mounted on opposite sides of said valve member, said pistons being mounted for axial movement within said cage toward and away from the outer surface of said valve member, the effective cross sectional area of the contact between each piston and the surface of said valve member being equal to the effective cross sectional area of each end of said cage, first pressure transfer means, a first end thereof communicating with the interior of said body near said first piston, second pressure transfer means, a first end thereof communicating with the interior of said body said second piston, a first pressure chamber within said body adjacent one end of said cage, a second pressure chamber within said body adjacent the other end of said cage, first hydraulic means establishing communication between said first pressure transfer means and said second pressure chamber, and second hydraulic means establishing communication between said second pressure transfer means and said first pressure chamber, whereby pressure in said body upstream from said valve member is balanced by pressure on the downstream end of said cage.

4,566,673

HYDRAULIC DEVICE FOR RERAILING VEHICLES

Siegfried Smuda, Erlangen; Peter Horner, Nuremberg; Karl Kögel, Erlangen, and Peter Zeitler, Fürth, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 528,084, Aug. 31, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 651,444
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233752
Int. Cl.[4] B66F 3/00
U.S. Cl. 254—84 11 Claims

1. A hydraulic device applicable for use under temperature conditions which may vary unpredictably over the full range available in a particular climate for lifting and rerailing an overturned rail vehicle, comprising:

a rerailing bridge;

at least one hydraulic lift cylinder, adapted for lifting the overturned vehicle;

a roller carriage rolling along said rerailing bridge, this carriage being adapted for transporting the upright vehicle;

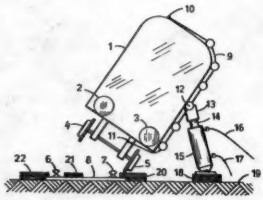
at least one traversing cylinder adapted for moving said roller carriage;

at least one of said cylinders having a piston therein which is displaceable along said cylinder; a pressure chamber in said cylinder at one side of the piston for being pressurized to bias the piston to be displaced to provide lift against the load; a second chamber in the cylinder at the other side of the piston;

a vacuum generator;

a hydraulic pressure generating unit, comprising a high pressure source with high pressure connection, and a first low pressure connection for feeding to the vacuum generator;

control valve means for selectively connecting the pressure chamber of the one cylinder with the high pressure connection for pressurizing the pressure chamber for biasing



the piston for lifting a load and for selectively connecting the pressure chamber with the first low pressure connection for the vacuum generator to reduce pressure in the pressure chamber for moving back the piston when the piston is not under load;

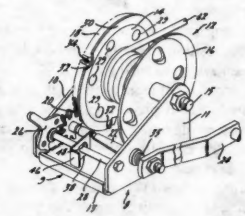
a low pressure source with a second reduced pressure connection connected to the second chamber of the cylinder for pressurizing the second chamber for biasing the piston contrary to the bias exerted by pressurizing the pressure chamber and for cooperating with the vacuum generator for returning the piston when the piston is not loaded, said hydraulic structure being usable over a full range of climatic temperature variations.

4,566,674

NEUTRAL WINCH

Edward Ebey, Nashotah, and Karl E. Richter, Sheboygan, both of Wis., assignors to Fulton Manufacturing Corporation, West Allis, Wis.

Filed Nov. 5, 1984, Ser. No. 667,982
Int. Cl.[4] B66D 1/14
U.S. Cl. 254—345 9 Claims



1. A winch characterized by:

a frame having two parallel wall sections;

a drum rotatably mounted to said frame with a mounting axle extending between said two wall sections;

a drum gear rigidly secured to said drum;

an operating shaft rotatably mounted on said frame parallel to said drum;

a handle operatively connected to said shaft;

a pinion gear mounted on said shaft for driving engagement to said drum gear when in a driving position;

said shaft being axially slideable on said frame to axially slide said pinion gear from said driving position to a disengage position to disengage from said drum gear and place said winch in a neutral mode;

an annular detent on said shaft;

a lock means attached to the frame and being receivable in said detent for locking said shaft in one axial position that positions said pinion gear in engagement with said drum gear;

said lock means including a spring member having one mounting end attached to one of said wall sections;

said spring member having an intermediate folded section which is receivable in said annular detent;

said spring member having a distal tab section that is manually engageable to be moved such that said spring member can flex and exit said detent to allow said shaft member to axially move; and

said spring member being biased to enter said detent when said shaft is in the engaged position.

4,566,675

CONTROL DEVICE FOR AN AIR HOIST

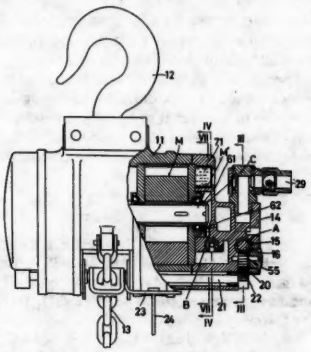
Yoshiharu Kotone, Nishinomiya, and Masaaki Hiraoka, Nara, both of Japan, assignors to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 468,993, Feb. 23, 1983, abandoned. This application Mar. 5, 1985, Ser. No. 708,037

Claims priority, application Japan, Dec. 1, 1982, 57-211803

Int. Cl.⁴ B66D *1/08, 5/02*

U.S. Cl. 254—360 **2 Claims**



1. A control device for an air hoist for lifting a load, comprising:

a main body housing therein a driving air motor;

a compressed air source;

an air circuit means for feeding air from the compressed air source to said air motor and for driving said air motor in the direction of normal rotation for lifting the load;

operating valve means, arranged in the air circuit means, for actuating the air motor;

a remote control tool means, provided in the air circuit means between the compressed air source and the operating valve means, for operating said operating valve means;

control valves and a check valve which are opened and closed by air, provided in the air circuit means between said air motor and said operating valve means;

a first adjustable throttle valve means, arranged in the remote control tool means, for controlling air to said check valve and said control valves;

a second throttle valve means, arranged in the remote control tool means upstream of the adjustable throttle means, for slow speed lowering of the load and for controlling air to said adjustable throttle valve means;

third and fourth throttle valve means, arranged in the remote control tool means and in the air circuit means parallel to said throttle valve means for slow speed lowering and lifting respectively, by feeding air to opposite sides of the operating valve means; and

two lever means for either individually or simultaneously operating said second and third throttle valve means;

one of said two lever means being connected to said second throttle means for slow speed lowering and the other of said two lever means being connected to said third throttle valve means for normal lowering.

4,566,676

SHORT TIP FOR A TORCH AND A TORCH TYPE TOOL

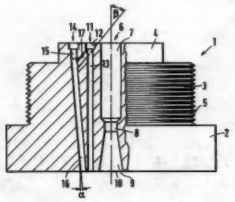
Horst K. Lotz, Kiefernweg 13, DE-6200 Wiesbaden-Delkenheim, Fed. Rep. of Germany

Filed Jun. 27, 1983, Ser. No. 507,982

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 8218358[U]; Sep. 17, 1982, 8226246[U]; Jan. 11, 1983, 8300552[U]

Int. Cl.⁴ B23K *7/00*

U.S. Cl. 266—48 **32 Claims**



1. A short tip for a torch, comprising a central oxygen passage; disposed adjacent the central oxygen passage, combustible gas feed passage means extending substantially parallel to said passage; and, disposed outside the combustible gas feed passage means, heating oxygen feed passage means which have at least a substantial portion extending at an inclined angle to the discharge end of the combustible gas feed passage means and issuing directly therebeside.

4,566,677

VIBRATION DAMPER AND IN PARTICULAR FREQUENCY ADAPTER FOR A HELICOPTER BLADE

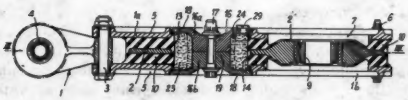
Gildas Le Pierres, La Ferte Alais, France, assignor to Vibrachoc, France

Filed Jun. 8, 1983, Ser. No. 502,236

Claims priority, application France, Jun. 11, 1982, 82 10198

Int. Cl.⁴ F16F *9/14*

U.S. Cl. 267—140.1 **4 Claims**



1. A vibration damping device comprising a first rigid element for connection to a first part such as for example a rotor, wherein the first rigid element has two substantially parallel parts spaced apart from each other and each provided with a first passage and a second passage, a second rigid element for connection to a second part such as for example a helicopter blade, wherein said second rigid element has a part which

extends between said two parts of said first element and carries bearing means within a first of said passages in said parts of said first element and a substantially oblong passage in axial alignment with a second of said passages of said two parts of said first element, and a mass of elastomer material interposed between and combined with said elements so as to be deformed when said elements are moved relative to each other substantially in a direction parallel to said first and second elements, the confronting surfaces of said parts of said two rigid elements being interconnected by said elastomer material, said oblong passage in said mass of elastomer material in axial alignment with said second passage of said two parts of said first element, a restriction element secured to one of said first and second rigid elements and inserted in said oblong passage in said mass of elastomer material so as to define substantially two chambers whose volumes vary inversely upon relative movement of said first and second rigid elements in said direction, wherein said restriction element has flanges which close said oblong passage in said elastomer material and a central part which defines said two chambers and throttling passage means putting said chambers in communication with each other, a viscous material filling said two chambers and said throttling passage means so as to produce a damping effect in said throttling passage means when the viscous material flows from one chamber to the other.

4,566,678

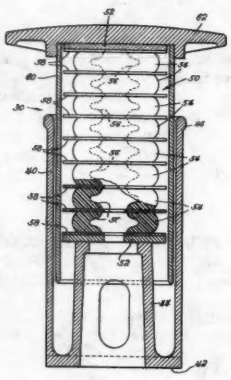
POLYMERIC APPARATUS AND METHOD OF MAKING THE SAME

David G. Anderson, Chesterton, Ind., assignor to Miner Enterprises, Geneva, Ill.

Filed Aug. 27, 1982, Ser. No. 412,119

Int. Cl.⁴ B60F *11/00*; B29C *17/00*

U.S. Cl. 267—141.1 **34 Claims**



23. A compression spring member comprising a body of thermoplastic elastomeric material having a selected transverse configuration and axial free height and transversely expanded hollow central core opening extending substantially therethrough, the material and said opening being uniform in cross-sections perpendicular to a central axis, said material being such that upon being axially compressed at least 30% of said initial axial length the material will permanently retain a substantial portion of the length reduction after being compressed, defined by axially compressing said body having the uniform said core opening, by an extent equal to at least thirty percent of the initial height of he uncompressed elastomeric material such that the configuration of the core opening is permanently expended transversely outwardly.

4,566,679

METHOD OF CLAMPING TUBE-LIKE MEMBERS AND APPARATUS FOR CARRYING OUT THE METHOD

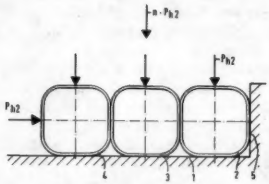
Karl H. Ehm, Duisburg, and Roderich R. Orendi, Düsseldorf, both of Fed. Rep. of Germany, assignors to Tremag Trennmaschinen-Gesellschaft mbH, Duisburg, Fed. Rep. of Germany

Filed Mar. 29, 1984, Ser. No. 594,575

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3312384

Int. Cl.⁴ B23D *47/04*

U.S. Cl. 269—23 **10 Claims**



1. Apparatus for clamping at least one tube-like member in position for processing thereof, comprising: a clamping support means having a support surface on which said at least one member rests; clamping means which is displaceable in a direction parallel to said support surface, adapted to engage said at least one member which in operation of the apparatus is disposed on said support surface, to clamp same on respective oppositely disposed sides thereof; a clamping member which is displaceable towards said support surface and adapted to engage said at least one member carried thereon, to urge same towards said support surface for clamping of said at least one member against said support surface; measuring means operatively associated with said clamping means and said clamping member for measuring geometrical deformation of said at least one member which occurs during a clamping operation and adapted to produce a signal to trigger the end of a respective clamping operation when deformation of said at least one clamped member reaches a specified value without being permanent.

4,566,680

VERTICALLY ADJUSTABLE DEVICE

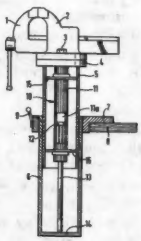
Wolfgang Schlegel, Oehringen; Arthur Wilke, Bad Friedrichshall-Jagstfeld, and Roland Stein, Oehringen, all of Fed. Rep. of Germany, assignors to Schlegel GmbH, Oehringen, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,537

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215217

Int. Cl.⁴ B25B *1/00*

U.S. Cl. 269—74 **9 Claims**



1. A vertically adjustable device comprising a vertical support tube for carrying a vise or assembly platform, a mounting for attachment of the support tube to a work bench or support,

said mounting comprising a guide tube accommodating the support tube for vertical adjustment and a clamping device for clamping the support tube in place in any vertical position, and further comprising a gas spring comprising a cylinder and a piston movable therein and a piston rod extending from the piston, said gas spring being arranged between said support tube and said guide tube to exert an upwardly directed force on the support tube, wherein the cylinder of the gas spring is arranged within the support tube and held therein by at least one disk having an inner and an outer periphery between the cylinder and the support tube, said inner periphery being in frictional engagement with the outer surface of the cylinder and said outer periphery being in frictional engagement with the inner wall of the support tube, and the piston rod removably abuts against the guide tube so that the gas spring is withdrawn simultaneously with support tube when the support tube is removed from the guide tube thereby leaving the workbench or support clear for other work without interference by the gas spring.

4,566,681

COLLATING MACHINE WITH ERROR-INDICATING REJECTION DEVICE

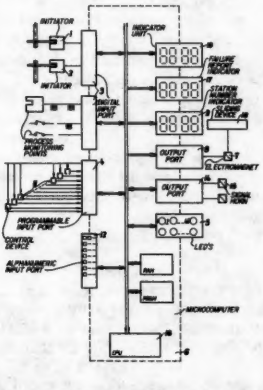
Rolf Böttcher, Markkleeberg, and Hans-Jürgen Lindner, Lützschena, both of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Aug. 27, 1982, Ser. No. 412,320

Claims priority, application German Democratic Rep., Oct. 26, 1981, 234352

Int. Cl.[4] B65H *39/02, 39/055*

U.S. Cl. 270—58 **6 Claims**



1. In a binding apparatus for the formation of book blocks of the type wherein individual sheets are fed to be formed into book blocks, and including a plurality of control devices for monitoring the formation of book blocks by signalling the faulty deposition of more than one sheet at a time and/or a missing sheet, the improvement comprising a programmable microcomputer having a digital input port, said microcomputer being connected to receive signals from said control devices at said input port, and a sliding device comprising a station number indicator, said sliding device being adjustable in response to signals from said microcomputer to successively receive a plurality of defectively formed book blocks each containing more than one of the same sheet or missing a sheet, said station number indicator having a plurality of fields for separately indicating the control device of the faulty formation each defective book block whereby the defect of each defective book block is readily determined.

4,566,682

ARRANGEMENT FOR REMOVING PHOTOSENSITIVE SHEETS FROM A CONTAINER

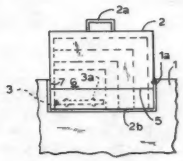
Jürgen Müller, Munich, and Werner Ihm, Schwaben, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 384,160, Jun. 1, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 657,395

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122585

Int. Cl.[4] B65H *3/08, 1/02*

U.S. Cl. 271—90 **10 Claims**



1. An arrangement for removing sheets through an opening of a container, especially X-ray film sheets from a light-tightly closable container, which receives the sheets next to one another substantially parallel to a common plane, at least some of the sheets being so dimensioned as to be movable in the container along the common plane toward and away from an abutment surface, comprising means for supporting the container in a predetermined position in which the opening is accessible; means for moving at least the next sheet to be removed along the common plane into abutment with the abutment surface, including at least one roller mounted for rotation about an axis and engaging at least the next sheet during the operation of the moving means, and means for rotating said roller about said axis so as to maintain said roller in contact with said next sheet and to urge the sheet engaged by said roller to move toward the abutment surface; and means for engaging the next sheet and withdrawing the same through the opening, said moving means further includes a carrier member mounted on said engaging and withdrawing means for movement relative thereto, said roller being mounted on said carrier member for rotation about an axis which is substantially parallel to the common plane.

4,566,683

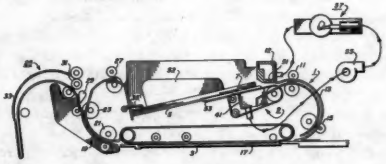
SHEET FEEDING APPARATUS AND VALVE THEREFOR

Kenneth P. Moore, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1983, Ser. No. 526,924

Int. Cl.[4] B65H *3/14*

U.S. Cl. 271—98 **2 Claims**



1. A bottom sheet separator/feeder for separating and forwarding sheets seriatim having a stack tray adapted for supporting a stack of sheets, comprising:

air injection means adapted to provide a layer of air between the tray and the bottom sheet in the stack in between the bottom sheet and the remainder of the sheets in the stack,

a pressure source associated with said air injection means for providing positive air pressure to said air injection means,

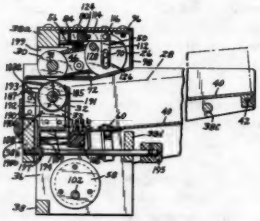
valve means associated with said air injection means being adapted to control the flow of air thereto from said source means and having a plurality of rotatable cylindrical valve elements each being arranged to provide a different air flow to said injection means, each of said valve elements being formed with a different flow restrictive opening relative to air flow through said valve means when said element is rotated into the air flow, said valve means including control means for selectively rotating said elements into the air flow.

4,566,684

AUTOMATIC SHEET FEED MECHANISM

Walter Gysling, Excelsior, Minn., assignor to National Computer Systems, Edina, Minn.

Filed Jan. 12, 1984, Ser. No. 570,164
Int. Cl.⁴ B65H *3/06*
U.S. Cl. 271—117 **13 Claims**



1. An automatic sheet feeding apparatus for feeding sheets in a forward direction; comprising:

(a) frame means for supporting a stack of sheets having a top surface and a bottom surface and including an uppermost sheet, said frame means including a hopper table member, having a back edge and a forward edge facing in the direction of sheet movement, for supporting said stack of sheets during feeding thereof, said hopper table member being pivotally mounted proximate said back edge for pivotal movement about a horizontal axis;

(b) mechanical lift means interconnected to said hopper table member for raising said front edge of said hopper table member whereby said hopper table member is pivoted about said horizontal axis;

(c) pick roller means arranged for engaging the top surface of said stack of sheets to advance the uppermost sheet of said stack of sheets in the forward direction and for detecting when the top surface of said stack of sheets is below a predetermined height, said pick roller means being interconnected to said lift means so as to mechanically actuate said lift means upon detecting the top surface of said stack of sheets as being below the predetermined height;

(d) means interconnected to said pick roller means for raising and lowering said pick roller means;

(e) sheet separating means for separating said uppermost sheet from any of said sheets inadvertently moved forwardly therewith, said sheet separating means including first and second separating rollers positioned forwardly of said stack of sheets and cooperating with one another; and

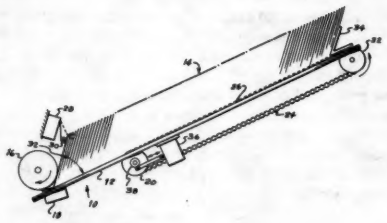
(f) integral drive means comprising single drive motor means operatively interconnected to said pick roller means, said sheet separating means and said lift means for driving said pick roller means, said sheet separating means, and said lift means.

4,566,685

DOCUMENT FEEDING DEVICE

Robert Irvine, Riverside; Frank T. Roetter, Westport, and Willis R. Stearns, Darien, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 6, 1984, Ser. No. 577,000
Int. Cl.⁴ B65H *1/02*
U.S. Cl. 271—150 **5 Claims**



1. A document feeding device, comprising:

a hopper oriented at an acute angle with respect to a horizontal plane, said hopper having a lower end, an upstream aperture and a downstream aperture and able to support a pack of documents to be fed therefrom;

means situated at the lower end of the hopper for feeding documents seriatim from the hopper;

a first pulley whose outer surface extends slightly through said downstream aperture and a second pulley whose outer surface extends slightly through said upstream aperture;

a double sided timing belt mounted on said first and second pulleys and riding on the upper surface of said hopper;

a switch in contact with the lead document of said pack of documents, said switch having contacts which close when the angle of repose of said pack of documents relative to the hopper is sufficiently decreased; and

a solenoid operatively connected to one of said pulleys and to said switch, wherein when said contacts are closed, said solenoid is energized to index said one pulley, whereby said timing belt is indexed forward, thereby moving said pack of documents forward and maintaining said pack of documents at an optimum pack pressure and angle of repose for seriatim feeding.

4,566,686

APPARATUS FOR FORMING A SPIRAL-LAYERED COILED STACK FROM SUBSTANTIALLY TWO-DIMENSIONAL FLAT STRUCTURES CONTINUOUSLY ARRIVING IN IMBRICATED FORMATION

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Apr. 3, 1985, Ser. No. 719,721
Claims priority, application Switzerland, Apr. 19, 1984, 1984/84; Sep. 21, 1984, 4533/84
Int. Cl.⁴ B65H *29/50*
U.S. Cl. 271—201 **25 Claims**

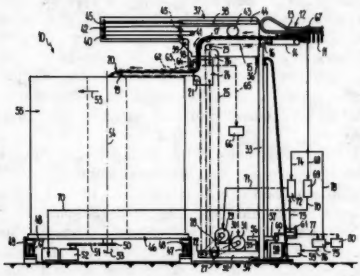
1. An apparatus for forming a spiral-layered coiled stack from substantially two-dimensional flat structures, especially printed products, continuously arriving in imbricated formation, comprising:

a delivery conveyor for delivering the imbricated formation; said delivery conveyor being provided with a conveyor discharge station;

a rotary driven stack support arranged beneath said conveyor discharge station and defining an upright axis of rotation;

said rotary driven stack support and at least said conveyor

discharge station being adjustable in height in relation to one another; and



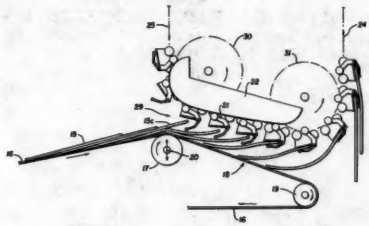
means for periodically displacing said conveyor discharge station and said upright axis of rotation relative to one another alternatingly toward and away from one another.

4,566,687

TRANSFERRING NEWSPAPERS OR THE LIKE FROM A MOVING BELT TO A SERIES OF CLAMPS

Hans G. Faltin, York, Pa., assignor to Custom-Bilt Machinery, Inc., York, Pa.

Filed May 11, 1984, Ser. No. 609,326
Int. Cl.⁴ B65H *29/66*
U.S. Cl. 271—202 **6 Claims**



1. In a conveyance system for transporting newspapers or the like by a succession of individual clamps, improved means for transferring the newspapers from a shingled array on a conveyor belt into the clamps for further transport thereby, comprising in combination,

conveyor belt means for transporting a shingled array of said newspapers along a conveyor belt path into a transfer station at a speed presenting the leading edges of the newspapers spaced by a distance X for a given increment of time,

clamp conveyance means for transporting a succession of spaced clamps in a path approaching the conveyor belt means and passing substantially parallel with a conveyor belt path section of the transfer station in the same direction before diverging therefrom at the end of a transfer zone encompassing a plurality of clamps, wherein the clamps are transported at a speed spacing the clamps a distance less than X for said increment of time, thereby permitting individual newspapers on the belt to move towards and overtake individual clamps within said transfer zone,

cam means synchronously operable to open the clamp jaws and to close them gradually over said transfer zone to receive thereinto said newspaper leading edges and clamp them in place for transport by the clamp conveyor means as they are conveyed in part on said belt through the transfer zone and means operable after the newspapers pass the conveyor belt path transfer zone diverging the paths of the conveyor belt path and the clamp conveyance means to remove the newspapers from the belt in the grasp of the individual clamps, and

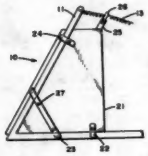
insertion means comprising conveying solely by frictional contact of a shingled array of newspapers on the conveyor belt over a roller where the direction of the belt path is changed to a downwardly inclined direction for registering the leading edge of newspapers carried on the belt into the open clamps in the initial part of the transfer zone.

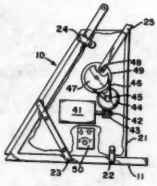
4,566,688

ACTUATION FOR SPRING MOUNTED HOBBY HORSE

Thomas A. Monica, Rte. 1, Cartersville, Ga. 30120

Filed Mar. 21, 1984, Ser. No. 591,955
Int. Cl.⁴ A63G *13/08*
U.S. Cl. 272—53.1 **18 Claims**





1. Apparatus for rocking a children's riding toy suspended from a frame having a plurality of generally upright members by a plurality of retractile springs each of which is attached at one end to said toy and at the other end to a frame member; comprising:

(a) at least one reciprocating arm means for imparting rocking motion perpendicular to the longitudinal axis of at least one of the retractile springs,

(b) clamp means for securing said reciprocating arm to at least one of the retractile springs along the longitudinal axis thereof, and

(c) drive means for reciprocating said reciprocating arm, wherein the reciprocating arm travel is within a range of from one-fourth inch to about three inches.

4,566,689

ADJUSTABLE MOTOR MOUNT ARRANGEMENT FOR EXERCISE TREADMILLS

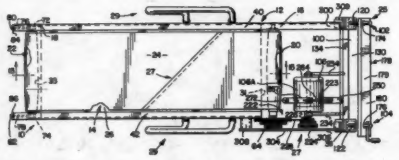
Ralph Ogden, Munster, Ind., assignor to Ajay Enterprises Corporation, Delavan, Wis.

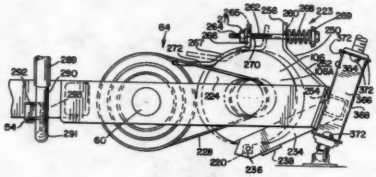
Division of Ser. No. 552,803, Nov. 17, 1983, and a continuation of Ser. No. 452,300, Dec. 22, 1982, abandoned, which is a division of Ser. No. 378,627, May 17, 1982, Pat. No. 4,445,683, which is a continuation-in-part of Ser. No. 226,766, Jan. 21, 1981, Pat. No. 4,374,587, said Ser. No. 552,803, is a continuation-in-part of Ser. No. 378,627,. This application Dec. 10, 1984, Ser. No. 679,862

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.[4] A63B *23/06*

U.S. Cl. 272—69 4 Claims





1. In an exercise treadmill including a generally planar slider bed having a head end, a tail end, and a top surfacing extending substantially between said ends thereof, an endless treadmill belt trained over said slider bed top surfacing and a lower run passing under said slider bed, and means for driving said belt for movement of said belt upper run from said head end to said tail end of said slider bed,

the improvement wherein:

said slider bed has a cross member extending transversely thereof adjacent and forwardly of said head end thereof,

said belt driving means comprising:

a head roller journalled in said slider bed adjacent the head end of same over which the belt is trained,

said head roller being journalled for rotation about an axis paralleling said cross member,

an electric drive motor assembly mounted on the cross member between said cross member and said head roller for pivotal movement about an axis substantially paralleling said cross member,

said drive motor assembly including a drive motor driving a drive shaft about an axis substantially paralleling said motor assembly pivot axis and having keyed to same a first drive stepping pulley for rotation about said drive shaft axis,

with said head roller having keyed to same a second drive stepping pulley for rotation about said head roller axis,

a pulley belt in drive transmitting relation between said pulleys, with said pulleys being in substantially coplanar stepping-reverse stepping relation,

said head roller axis and said drive shaft axis being in substantially coplanar relation in a plane substantially paralleling said slider bed,

said drive motor assembly pivot axis being disposed below said plane and said motor and disposing said drive motor assembly in cranking relation to said head roller axis about said drive motor assembly pivot axis for shifting said drive shaft axis toward said head roller axis in one direction of movement about said drive motor assembly pivot axis, and for shifting said drive shaft axis away from said head roller axis in the opposite direction of movement about said drive motor assembly pivot axis,

and means for subjecting said drive motor assembly to uniform spring biasing action in said opposite direction about its said pivot axis for uniformly tensioning said pulley belt into said drive transmitting relation with said pulleys and for spring absorption of load surges imposed on said pulley belt,

said drive motor assembly including a handle crank means for pivoting said drive motor assembly in said cranking relation in said one direction about its said pivot axis in opposition to said subjecting means for manually relieving the tensioning of said pulley belt for freeing same from said drive transmitting relation with said drive pulleys for adjusting said pulley belt relative to said pulleys for changing the speed of movement of said treadmill belt, as driven by said drive motor, stepping pulley fashion,

said biasing action of said subjecting means, on manual release of said handle crank means with said pulley belt positioned for said drive transmitting relation with said pulleys in the changed speed relation of same to said pulleys, acting on said drive motor assembly for pivoting said drive motor assembly in said cranking relation in said opposite direction about its said pivot axis for restoring said uniform tensioning of said pulley belt into said drive transmitting relation with said pulleys in the adjusted speed relation of same and for said spring absorption of load surges imposed on said pulley belt.

4,566,690

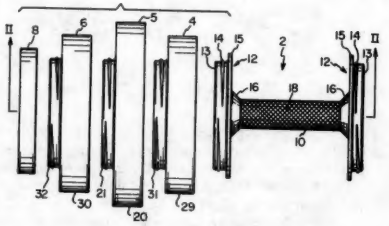
DUMBELL AND BARBELL EXERCISE EQUIPMENT

Michael N. Schook, 121 Lycoming Dr., Coraopolis, Pa. 15108

Filed May 10, 1984, Ser. No. 608,997

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 20 Claims



1. Weight training apparatus comprising:

(a) an elongated handle having a cylindrical male connector on each end of said handle,

(b) a plurality of weights adapted to be mounted both to said handle and to each other, each of said weights including a substantially right cylindrical body with a cylindrical male connector extending outwardly from one face of the body and a cylindrical female connector recessed into the opposite face of the body, said male connector of each weight adapted to be joined to the female connector of another weight and thereby join said weights together, and said female connector of each weight adapted to engage said male connector on the handle and thereby join a weight to said handle,

(c) the diameter of the male connector of each weight and the male connector of the handle being at least about one-half of the diameter of the body of each of said weights,

whereby the weights are easily assembled and disassembled

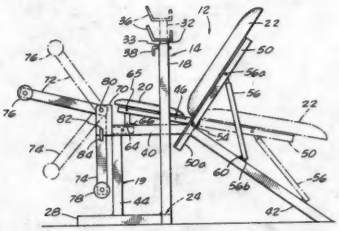
and are supported by said connectors without bending or twisting or placing damaging stress on said connectors.

4,566,691

EXERCISE BENCH

Parker E. Mahnke, Studio City, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.

Filed Nov. 9, 1983, Ser. No. 550,298
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **12 Claims**



1. An exercise bench for use by a trainee in the performance of free weight exercises using a barbell type apparatus having an elongate bar with weights carried on either end thereof, comprising:

(a) a first frame assemblage having a pair of spaced apart upstanding members, including support means for supporting the elongate bar of the bar bell apparatus;

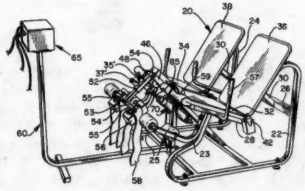
(b) a second frame assemblage cooperatively associated with said first frame assemblage including a seat portion and an inclined back portion, a substantial portion of said seat portion being disposed forwardly of the plane of said upstanding members and a portion being disposed rearwardly thereof and said back portion being spaced apart therefrom, whereby with the barbell apparatus being supported on said support means the trainee can sit on said seat portion facing the elongate bar of the apparatus and engage said back portion with his back, his upper torso being positioned between the elongate bar and said back portion.

4,566,692

COMPUTERIZED EXERCISING DEVICE

Jerry D. Brentham, 2121 Industrial Park Rd., Belton, Tex. 76513

Filed May 18, 1983, Ser. No. 495,806
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 **24 Claims**



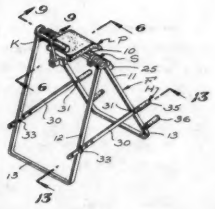
1. A double acting hydraulic cylinder comprising first and second tubular members, the second tubular member extending through the first tubular member forming an annulus between walls of the first and second tubular members; a single piston in said second tubular member; spaced closure means in said annulus forming a reservoir; check valve means having a passage communicating with the reservoir and the inside of the second tubular member, said check valve means being adapted to permit flow of fluid from the reservoir to the inside of the second tubular member and to block flow of fluid from each end of the second tubular member to the reservoir; first valve means arranged to meter flow of fluid from a first end of the cylinder to said reservoir upon movement of said piston in the second tubular member in a first direction; second valve means arranged to meter flow of fluid from a second end of the cylinder to sadi reservoir upon movement of said piston in the second tubular member in a second direction; a valve element in each of said valve means to independently and selectively meter fluid flow from each end of the second tubular member to the reservoir upon movement of said piston in opposite directions.

4,566,693

GRAVITY TRACTION APPARATUS

Alfred T. Seidentop, Santa Maria, and John E. Johnson, Villa Park, both of Calif., assignors to Stretch Forming Corporation, Fountain Valley, Calif.

Filed Jun. 7, 1982, Ser. No. 385,682
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—144 **3 Claims**



1. A gravity traction apparatus for human users, comprising:

a vertically-extending frame with front and rear sides for mounting on a floor or like surface and including a horizontally disposed, transversely-extending beam member supported adjacent the upper end thereof;

a thigh-pad structure with a generally flat, thigh-engaging surface having front and rear portions, supported on said beam member for pivotal movement between an inoperative position in which said surface is generally vertically disposed and an operative position in which said surface is generally horizontally disposed; and

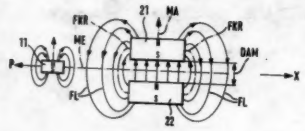
a knee-stop member and supporting means therefor carried by the thigh-pad structure, said knee-stop member including a transversely-extending leg-engaging portion which is spaced downwardly and rearwardly relative to the rear portion of said thigh-engaging surface when the thigh-pad structure is in the inoperative position, said supporting means being at a fixed distance relative to the rear portion of said thigh-pad structure, the amount of the spacing of the knee-stop member from said suppor ing means causing the leg-engaging portion to engage the legs of a user in the areas in back of the knees when the user is standing on the surface on which the frame is mounted and between said knee-stop member and said thigh-engaging surface,

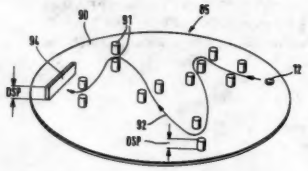
in which the frame includes spaced-apart front legs and stop means for limiting the pivotal movement of the thigh-pad structure between the inoperative position and the operative position, which stop means includes a tie-bar connected to and extending between the front ends adjacent to the beam member.

4,566,694
MAGNETIC GAME

Kurt Ehrat, Grebweg 17, CH-8162, Steinmaur, Switzerland

Filed Aug. 10, 1983, Ser. No. 522,060
Claims priority, application Switzerland, Aug. 14, 1982, 4903/82
Int. Cl.[4] A63F 7/06, 7/24; A63H 30/00
U.S. Cl. 273—1 GB 41 Claims





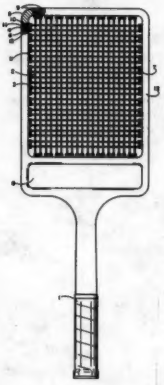
1. A magnetic game, comprising a playing board having spaced apart, substantially parallel top and botton walls, at least said top wall consisting of light-transmitting material; at least one playing piece disposed between said walls and including at least one permanent magnet, said playing piece being movable between and along said walls, and said walls being arranged to hold said playing piece against tilting so that the polar axis of said magnet is invariably at least nearly perpendicular to said walls; and impeller means including a first shifting member situated outwardly adjacent to and manually movable along said top wall, and a second shifting member situated outwardly adjacent to and movable along said bottom wall, said first shifting member comprising a first permanent magnet arranged so that the polar axis thereof is at least nearly perpendicular to said walls, and said second shifting member comprising a second permanent magnet arranged so that the polar axis thereof is at least nearly perpendicular to said walls, said first and second magnets being coupled to one another for movement along the respective walls substantially as a unit, and the polar axes of said first and second magnets being at least substantially coincident all of said magnets having the same direction of magnetization.

4,566,695
GAME RACKET HAVING ADJUSTABLE STRING MOUNTS

Phillip J. Melby, Box 656, Mason City, Iowa 50401

Filed Mar. 17, 1983, Ser. No. 476,034
Int. Cl.[4] A63B 51/12
U.S. Cl. 273—73 D 1 Claim

1. A racket for tennis, wherein the improvement comprises a racket handle and rectangular racket frame head and means for adjusting string loop tautness, said means consisting of an adjustable mounting stud with a threaded section, mounted in said racket frame head, a threaded nut for engagement with said threaded stud section mounted in said racket frame head,



and stud legs of said mounting stud fitting in blind holes in said racket frame head.

4,566,696
GOLF CLUB SWING TRAINING METHOD

Floyd D. Horgen, 1046 Fairlawn Dr., Rockledge, Fla. 32955

Filed Jul. 29, 1983, Ser. No. 518,625
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—193 A 1 Claim

PROVIDE A RAISED HORIZONTAL SURFACE
PROVIDE GOLFER WITH SHORTENED SHAFT CLUB
PRACTICE FULL SWING RIGHT ARM DRILL
PLACE GOLF BALL ON SURFACE
PRACTICE LEFT HAND & FOREARM DRILL WITH SHORT SWING
PRACTICE FULL SWING RIGHT ARM DRILL
PRACTICE TWO ARM DRILL WITH SHORT SWING FEELING LEFT ARM CONTROL
PRACTICE TWO ARM DRILL WITH SHORT SWING FEELING BODY PIVOT
PRACTICE RIGHT HAND FOREARM DRILL WITH SHORT SWING FEELING BODY PIVOT

1. A method of practicing a golf swing using a shortened shaft golf club and a raised generally horizontal surface capable of supporting a golf ball, the method comprising:

(a) hitting a ball off of the raised surface using a shortened swing of the golf club while gripping the golf club with a left hand only to experience during the shortened swing a feeling of a straight to slightly convex position of the back of the left wrist;

(b) hitting a ball off of the raised horizontal surface using a shortened swing of the golf club while gripping the golf club with both hands to repeat the feeling experienced in step (a);

(c) hitting a ball off of the raised horizontal surface using a shortened swing of the golf club while gripping the club with the right hand only to experience during the swing a feeling of a natural pivoting action of the body on the right leg and hip during back swing and down swing

portions of the shortened swing and experiencing the natural pivoting action of the body on the left leg and hit during a follow-through portion of the shortened swing;

(d) hitting a ball off of the raised horizontal surface using a shortened swing of the golf club while gripping the club with both hands to repeat the feeling experienced during step (c);

(e) hitting a ball off of the raised horizontal surface using a full swing of the golf club while gripping the club with the right hand only to repeat the feeling experienced during steps (c) and (d); and

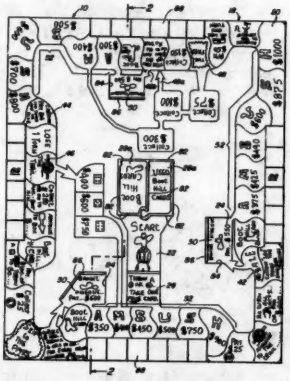
(f) hitting a ball off of the raised horizontal surface using a full swing of the golf club while gripping the club with both hands to repeat the feeling experienced during steps (c), (d) and (e).

4,566,697

WESTERN GAME OF SKILL AND RISK

Kenny B. Vickers, 147-33 229th St., Rosedale, N.Y. 11413

Filed Jan. 6, 1984, Ser. No. 568,789
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—241 **12 Claims**



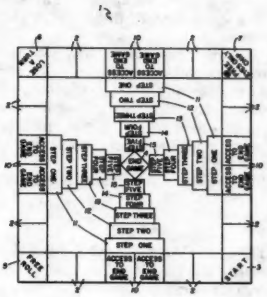
1. In a game apparatus, the combination of a game board having a continuous path around its perimeter divided into consecutive spaces having alternate paths and bearing instructions representing amounts to be paid or received during the game, each of said spaces defining a playing position, a plurality of playing pieces one for each of the game players, said playing pieces being of a size to fit within said playing positions, play money of different denominations for distribution of part thereof to each player, one deck of cards bearing instructions means, a raised tray means on the game board for each player, said raised tray means including a plurality of storage spaces for displaying some of said cards, a chance determining device to represent the number of playing positions to be moved by the playing pieces, said game board further comprising a card area for storing said deck of cards, said card area being encased by upstanding vertical walls so that said cards will remain in order, the spaces positioned between at least some of the junctions between said alternate paths being depressed spaces and including raised guard walls about a portion of said depressed spaces projecting above the game board.

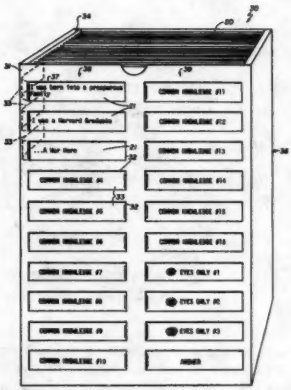
4,566,698

CHARACTER IDENTITY GAME

Marcia A. Sneden, 27 Colony Rd., Lexington, Mass. 02173

Filed Jan. 23, 1985, Ser. No. 694,124
Int. Cl.[4] A63F *3/00, 9/18*
U.S. Cl. 273—249 **6 Claims**





1. A competitive character identification board and card game for a plurality of players, comprising:

a game board having a plurality of blocks defining a main path delineated about the periphery of the board and defining a plurality of subsidiary paths leading from the main path to a block in the center of the board;

a plurality of differently identified tokens sufficient in number to provide each player with a token whereby each player's position on the game board may be identified;

a number selection device adapted to determine order of play among the players and the number of blocks to which a player's token is to advance;

a plurality of resumes each of which contains on one side a plurality of biographical entries providing clues to the identity of a particular character and one entry providing the identity of the character whereby one or more of said clues are provided a player whose token lands on a block in the main path and whereby a player's continued advancement about the game board is determined by correctly identifying the character on a resume from clues contained thereon;

a box for holding resumes which box contains on one face a plurality of windows with individual means for covering each window, whereby a window is opened revealing an entry on a resume for each player whose token lands on a block in the main path on the board;

a plurality of chips which are used to obtain additional clues on a resume, some of which chips a player is given at the beginning of the game and others of which a player obtains by guessing the identity of a resume character or by landing on a particular block in the main path on the game board;

a plurality of pins one of which is obtained by a player each time the player guesses the identity of a resume character and which are attached to the token of the player correctly guessing; and

a plurality of cards containing a plurality of biographical entries providing clues to the identity of a particular character and one entry providing the identity of the character, whereby a player having a certain number of pins and having gained access to a subsidiary path is given clues from the card and his advancement towards the block in the center of the board determined by the number of clues given before the character is identified by said player.

4,566,699

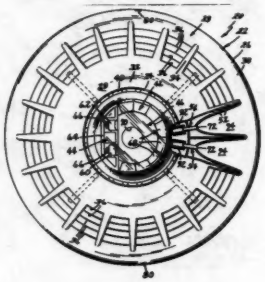
FLYING APPARATUS AND METHOD

Joseph R. Cucuzza, Bellevue, Wash., assignor to Richards Aerospace Research Corporation, Burnsville, Minn.

Filed Dec. 27, 1982, Ser. No. 453,241

Int. Cl.⁴ B64C *39/06*

U.S. Cl. 244—12.2 **27 Claims**



27. In combination with an annular airfoil having an upper wall defining therein an annular portion having a multiplicity of outwardly venting louvers; a plurality of radially extending, equi-angularly spaced engines disposed about the airfoil to direct exhaust through said louvers and over an upwardly facing surface of said wall, each of said engines having its air intake situated in a common chamber, and wherein, during movement of the combination structure in an intended direction of forward movement, engines forwardly disposed can be shut off and function as ram air ducts through which air can pass into said common chamber and to air intakes of operating engines said engines each comprising a three-stage combustion air intake, and wherein operation of said engines occurs without movement of component elements thereof.

4,566,700

ABRASIVE/ABRADABLE GAS PATH SEAL SYSTEM

Lawrence T. Shiembob, Rocky Hill, Conn., assignor to United Technologies Corporation, Hartford, Conn.

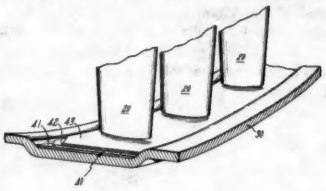
Filed Aug. 9, 1982, Ser. No. 406,404

Int. Cl.⁴ F01D *5/06, 11/00*

U.S. Cl. 277—53 **17 Claims**

1. In an apparatus which operates under conditions where titanium combustion can occur, and which includes closely spaced titanium components between which relative motion occurs and between which clearances and fluid flow must be minimized while direct rubbing contact must be avoided, the improvement which comprises:

providing on one component a composite plasma sprayed sealing coating which includes a plasma sprayed abrasive layer on said component and a plasma sprayed abradable layer on said plasma sprayed abrasive layer, wherein, during rubbing contact between an uncoated component and the abrasive layer, greater than 80% of wear occurs in the uncoated component and less than 20% occurs in the abrasive layer while, during rubbing contact between an uncoated titanium alloy component and an abrasive layer greater than 60% of the resultant wear occurs in the



abradable layer and less than 40% occurs in the uncoated component, with the thicknesses of the abrasive and abradable layers and the component clearances being such that in normal operation, the uncoated component encounters and abrades the abradable layer without being significantly abraded itself, while under abnormal operating conditions the uncoated component encounters and is abraded by the abrasive layer and does not directly contact the coated component substrate.

4,566,701

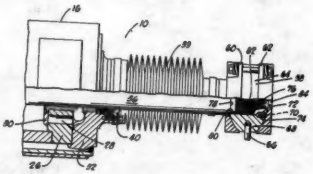
CUSHIONING UNIT SHAFT SEAL

Charles T. Bomgardner, Burleson, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1983, Ser. No. 533,844

Int. Cl.⁴ F16J *15/32*

U.S. Cl. 277—58 **6 Claims**



1. An improved combination of piston shaft oil seals for sealing a piston shaft of an end-of-car hydraulic cushioning unit to allow the efficient substantially leak-free sealing of said piston shaft while maintaining a film of oil on said piston shaft over a wide range of environmental operating conditions, the combination comprising:

a first annular piston shaft oil scraper seal of resilient materials, the seal having an inner most lip which sealingly engages said piston shaft having, in turn, a hardness of substantially ninety durometer;

a second annular piston shaft oil scraper seal of resilient material, the seal having an inner most lip which sealingly engages said piston shaft to remove or scrape oil therefrom to help prevent oil loss from said end-of-car hydraulic cushioning unit; and

a third annular piston shaft oil scraper seal of resilient material, the seal having an inner most lip having, in turn, a harness of substantially seventy durometer, the third annular piston shaft oil scraper seal sealingly engaging said piston shaft to allow the efficient substantially leak-free sealing of said piston shaft when sealingly engaging said piston shaft in conjunction with the first annular piston

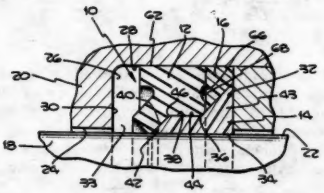
shaft oil scraper seal and the second annular piston shaft oil scraper seal while maintaining a film of oil on said piston shaft over a wide range of environmental operating conditions.

4,566,702

SEAL ASSEMBLY WITH IMPROVED LOW PRESSURE SEALING RING

Henry A. Traub, Pacific Palisades, Calif., assignor to W. S. Shamban & Company, Santa Monica, Calif.

Filed Mar. 18, 1985, Ser. No. 712,667
Int. Cl.[4] F16J 15/24, 15/32
U.S. Cl. 277—121 14 Claims



1. A low pressure seal ring adapted for use in combination with a high pressure seal ring to provide a seal assembly which is capable of sealing first and second relatively reciprocating surfaces at both high and low pressures, wherein said high pressure seal ring includes an inner sealing surface for sealing contact with said first reciprocating surface and a low pressure seal ring support portion, said low pressure seal ring support portion including an outer low pressure seal ring support surface having an inclined seal lip support surface which tapers inward towards said inner sealing surface, said seal lip support surface having a left end which terminates at said inner sealing surface to provide a high pressure seal apex adjacent said first reciprocating surface and a right end, said low pressure seal ring support surface further including an axial low pressure seal body support surface which is substantially parallel to said inner sealing surface, said seal body support surface having a left end which meets the right end of said seal lip support surface, wherein said low pressure seal ring comprises:

an annular seal ring body comprising:

a seal lip portion having a bottom seal lip surface adapted to be supported by the seal lip support surface of said high pressure seal ring, said seal lip surface including an annular sealing tip at its left end said sealing tip extending out past and adjacent to the apex of said high pressure seal ring for sealing contact with said first reciprocating surface; and

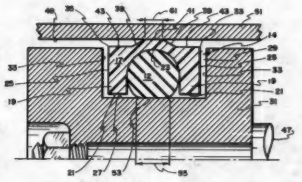
a seal body portion having a left part integral with said seal lip portion and a right part, said seal body portion further including an outer surface and an inner surface, said outer surface adapted to sealingly contact said second reciprocating surface and said inner surface adapted to be supported by the support surface of said high pressure seal ring, wherein said outer and inner surfaces diverge from each other from said seal body left part to said seal body right part to provide an increase in the radial width of the cross section of said seal body to thereby increase the compressive forces exerted on said seal body right part when said low pressure seal ring is positioned between said second reciprocating surface and said high pressure seal ring.

4,566,703

SEAL ASSEMBLY

Gordon T. Zitting, Sandy, Utah, assignor to Microdot Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 257,045, Apr. 24, 1981, abandoned, which is a continuation of Ser. No. 58,341, Jul. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 883,448, Mar. 6, 1978, abandoned. This application Jun. 13, 1983, Ser. No. 503,941
Int. Cl.[4] F16J 9/06, 15/24
U.S. Cl. 277—165 8 Claims



1. A compression high pressure/low pressure seal assembly, solely made up of two elements in combination with two closely spaced relatively reciprocable machine parts, the first of the machine parts having a peripheral groove comprising spaced sidewalls and a base between the sidewalls, the assembly comprising:

an endless relatively soft annular spring element of yieldable material with memory and having a yieldable solid cross-sectional configuration;

an endless annular sealing element comprising a house-shaped body of relatively hard wear resistant synthetic resinous material having a generally U-shaped cross-sectional configuration;

said sealing element further comprising spaced radially directed anti-spring contact elongated anti-extrusion and anti-roll legs, which comprise a size, shape and thickness to, at all times within a predetermined high-to-low pressure range, (a) keep the spring element from touching either groove sidewall and (b) maintain an essentially stable radial alignment between the spring element and the sealing element, the length of each of said elongated legs being coextensive with substantially the entire adjacent sidewall, a thin space separating the end of each elongated leg and the base of the groove;

the spring element being positioned between and having a radial dimension extending beyond the ends of the elongated legs across said thin space to compressively engage the base of the groove while preserving the thin space thereby accommodating creation of a first static seal solely and directly between the extended part of the spring element and the base of the groove in the first machine part while prohibiting any sealing relation between the sealing element and the base of the groove;

the interior surface formed by and between the elongated legs comprising saddle region means which comprises a contiguous nested relationship with the exterior surface of the spring element;

a second static seal being formed solely and directly between one exterior elongated leg surface and substantially all of one sidewall of the groove while prohibiting any sealing relationship between the spring element and either groove sidewall whereby at all times, when under pressure from one side or the other of the seal assembly, the elongated leg away from the pressure is caused to be contiguous with essentially the entire surface of the adjacent sidewall and at all times said elongated legs maintain the spring element in spaced relationship with both sidewalls of the groove and in direct radial alignment with the sealing element;

said house-shaped portion of the sealing element, which at all times isolates the spring element from contact with the

second machine part, comprising an anti-drift delta-shaped projection having central disposed narrow apex means retained in radial alignment with the spring element, the projection extending radially opposite to the direction of said anti-extrusion and anti-roll legs and beyond said groove, the apex compressively engaging the surface of a second machine part in such a fashion so as to cause said apex to no more than slightly flatten solely at the tip region thereof and to create an annular line dynamic seal solely along the entirety of the 360 degrees of said slightly flattened tip region and in direct radial alignment with the centerline of the spring element, the width of said line seal being several times less than the width of the groove whereby a surprisingly stable high pressure resistance is developed in excess of any hydraulic or pneumatic pressure applied to the seal assembly.

4,566,704

SEALING BODY FOR A PIPE CONNECTION

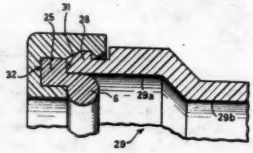
Jan P. van Dongeren, Bergentheim, Netherlands, assignor to Wavin B. V., Zwolle, Netherlands

Division of Ser. No. 570,695, Jan. 13, 1984, abandoned, which is a division of Ser. No. 398,234, Jul. 14, 1982, abandoned, which is a division of Ser. No. 133,792, Mar. 25, 1980, abandoned. This application Mar. 18, 1985, Ser. No. 712,650

Claims priority, application Netherlands, Mar. 30, 1979, 7902516

Int. Cl.⁴ F16L *11/08*

U.S. Cl. 277—207 A **1 Claim**



1. A socket pipe part (29), the outer side of the socket snappingly engaging a retaining ring thus forming an outer annular groove chamber, a head portion (25) of a sealing sleeve (6) being retained in said groove chamber said head portion being chemically intimately bonded to the inner surface of said retaining ring so that no leakage will occur between the bottom (32) and the surface of head portion (25) engaging said bottom when liquid reaches the region between the front end (31) of said socket and part of the head portion opposite its free end.

4,566,705

TOOL RETAINER HAVING AXIALLY AND RADIALLY MOVABLE CLAMPING MEMBERS

Werner Jenny, Münsingen, Fed. Rep. of Germany, assignor to TBT Tiefbohrtechnik GmbH & Co. KG, Dettingen, Fed. Rep. of Germany

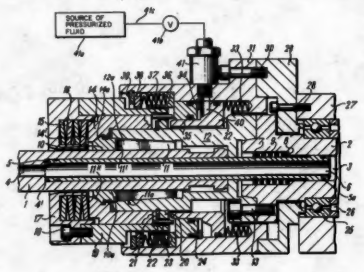
Filed Jun. 4, 1984, Ser. No. 616,958

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320612

Int. Cl.⁴ B23B *31/30*

U.S. Cl. 279—4 **17 Claims**

1. Apparatus for releasably holding the tubular shank of a drilling tool, comprising a stationary housing; a rotary member mounted in said housing and including a substantially sleeve-like portion having a conical internal surface; a clamping device movable axially of said rotary member and having a shank-receiving axial passage and a plurality of substantially radially movable claws surrounding at least a portion of said passage and having conical external surfaces complementary to and adjacent to said internal surface, said rotary member having an axial bore in communication with the interior of the tubular shank in said clamping device; resilient means for urging said clamping device axially in a first direction to thereby bias said claws against the tubular shank in said passage through the medium of said internal surface; a separate axially movable motion transmitting means interposed between said resilient means and said clamping device to move said clamping device axially of said rotary member under the action



of said resilient means; and fluid-operated motor means actuatable to move said clamping device in a second direction counter to said first direction through the medium of said motion transmitting means and to thereby relax the bias of said claws upon the tubular shank in said passage, said motor means comprising a cylinder fixedly attached to said housing.

4,566,706

EASY-ADJUST STAIR CLIMBER FOR WHEELCHAIR

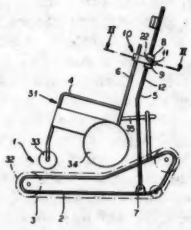
Franz Bihler, and Anton Abele, both of Augsburg, Fed. Rep. of Germany, assignors to Kleindienst GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 7, 1983, Ser. No. 511,790

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225770

Int. Cl.⁴ B62B *5/02, 9/02;* B62D *55/00;* A61G *5/00*

U.S. Cl. 280—5.22 **4 Claims**



1. An apparatus for moving a wheelchair having a pair of upright rear frame members, the apparatus comprising:

a support adapted to engage underneath the wheelchair in an upright condition of same, the wheelchair being pivotal on the support between erect and inclined positions;

two endless tracks on the support and supporting same and the wheelchair carried thereon, whereby the tracks allow the wheelchair to move on an incline;

a frame element pivotal on the support about a horizontal axis transverse to the tracks;

a transverse mount vertically displaceable on the frame element and having outer ends respectively juxtaposed with the wheelchair frame members;

an adjustment spindle extending along and rotatable about a horizontal axis through the mount ends adjacent the frame members and having oppositely threaded ends at the outer ends;

respective mounting blocks axially slidable in the outer mount ends and threaded on the adjustment-spindle ends, whereby rotation of the spindle in one direction about its axis moves the two blocks axially apart and opposite rotation moves them axially together, the mounting blocks being formed with seats to fit with the respective wheelchair frame members, whereby the blocks can be moved together and apart by means of the spindle to fit to chairs of different sizes;

respective clips pivotal on the blocks about respective upright axes between holding positions securing the respective wheelchair frame members in the respective seats and releasing positions out of engagement with the respective wheelchair frame members, and

respective means for securing the clips in the holding positions, the securing means including respective spring-loaded pins parallel to and offset from the respective upright clip axes, the pins being axially displaceable into and out of engagement with the respective clips.

4,566,707

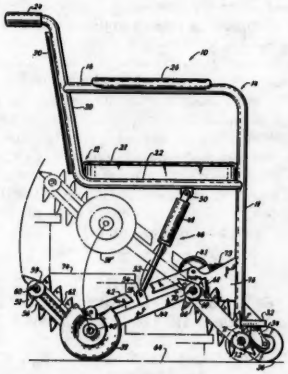
WHEEL CHAIR

Leonard R. Nitzberg, 1413 Buckeye La., Knoxville, Tenn. 37919

Continuation-in-part of Ser. No. 318,631, Nov. 5, 1981, Pat. No. 4,432,425. This application Feb. 21, 1984, Ser. No. 582,066

Int. Cl.⁴ B62D *57/02*

U.S. Cl. 180—8.2 **17 Claims**



1. Apparatus for moving an object over substantially varying terrain, including stairs having stair treads, which comprises:

a frame for supporting said object, said frame having opposite sides and a front portion and a rear portion;

first wheel means mounted from said front portion of said frame having a front wheel proximate each side of said frame for engagement with said terrain;

second wheel means mounted from said rear portion of said frame having a rear wheel proximate each side of said frame for engagement with said terrain;

drive means connected to at least one of said first and said second wheel means for rotating corresponding of said wheels against said terrain;

first level sensing means carried by said frame for continuously sensing any change in pitch of said frame from a pre-set pitch value;

means responsive to said first level sensing means connected between said frame and at least one of said first and second wheel means for correcting said pitch to said pre-set pitch value;

rotatable means carried by said frame for engaging said stair treads and for moving said frame ascending and descending said stairs, said rotatable means comprising a plurality of flexible endless members supported from said frame in a plane substantially perpendicular to said terrain, means for rotating said endless members, and stair tread engaging lugs attached to and extending outwardly from said endless members in said plane; and

means for selectively varying the relative rotational speed of said flexible endless members to facilitate the positioning of said tread engaging lugs of said endless members in supportive contact with said stair treads.

4,566,708

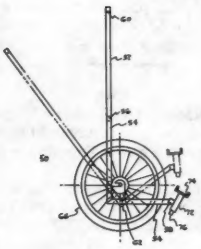
GENERAL PURPOSE DOLLY FOR CAMPGROUNDS

Roy L. Specie, P.O. Box 635, Bradenton, Fla. 33506

Continuation of Ser. No. 452,412, Dec. 23, 1982, Pat. No. 4,505,489. This application Dec. 24, 1984, Ser. No. 686,035

Int. Cl.⁴ B62B *1/12*

U.S. Cl. 280—47.13 R **8 Claims**



1. A general purpose dolly, comprising:

(a) a pair of parallel, elongated L-shaped handle elements;

(b) a pair of parallel, shorter L-shaped frame elements, said shorter L-shaped frame elements being parallel to said elongated L-shaped handle elements;

(c) a plurality of spacer elements interconnecting said elongated L-shaped handle elements and said shorter L-shaped frame elements at the upper ends of said frame elements and a first cross bar interconnecting said elongated L-shaped handle elements and said shorter L-shaped frame elements at the lower ends thereof such that said elongated L-shaped handle elements are positioned between said shorter L-shaped frame elements;

(d) a slotted plate fixedly positioned in the corner of each L-shaped handle element and each L-shaped frame element;

(e) a pair of rubber tired bicycle wheels, each rotatably mounted in the slots of said slotted plates between one of said elongated L-shaped handle elements and one of said shorter L-shaped frame elements above the level of the lower portions of said elongated L-shaped handle elements and said shorter L-shaped frame elements;

(f) a coupler fixedly attached to said first cross bar, said coupler being suitable for use with attachments having either male or female coupling means; and

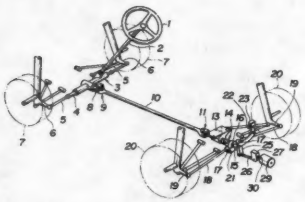
(g) a second cross bar interconnecting the upper ends of said elongated L-shaped handle elements, said second cross bar functioning as a hand grip for the person using the general purpose dolly.

4,566,709

STEERING SYSTEM FOR VEHICLES

Shoichi Sano, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,323
Claims priority, application Japan, Oct. 17, 1983, 58-193663
Int. Cl.[4] B62D 7/00
U.S. Cl. 280—91 7 Claims



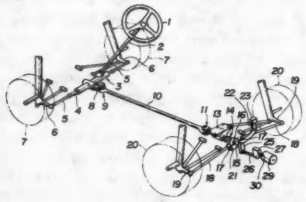
1. In a steering system for vehicles, in which a rear wheel is steerable in relation to the steering operation of a front wheel, and the steered angle ratio of said rear wheel to said front wheel is controlled in accordance with the vehicle speed, an improvement comprising deviation detecting means for detecting the relative deviation between the steered angle ratio the vehicle actually has and a steered angle ratio set in accordance with the vehicle speed, and speed control means for controlling to decrease or hold constant the vehicle speed when said relative deviation is larger than a predetermined value.

4,566,710

STEERING SYSTEM FOR VEHICLES

Yoshimi Furukawa, Saitama, and Shoichi Sano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,322
Claims priority, application Japan, Oct. 17, 1983, 58-193661
Int. Cl.[4] B62D 7/00
U.S. Cl. 280—91 6 Claims



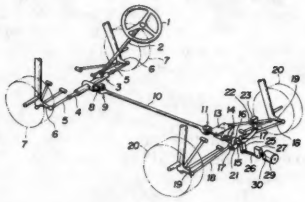
1. A steering system for vehicles including a steering wheel, a front wheel, front steering means for steering said front wheel, a rear wheel, rear steering means for steering said rear wheel, ratio changing means for changing the steered angle ratio of said rear wheel to said front wheel, control means for controlling said ratio changing means, ratio detecting means for detecting the steered angle ratio, said ratio detecting means cooperating with said control means, speed detecting means for detecting the vehicle speed, and said speed detecting means cooperating with said control means, in which said rear wheel is steered at relatively low vehicle speeds in the opposite direction to said front wheel or substantially at an angle of zero degree and at relatively high vehicle speeds in the same direction as said front wheel, wherein means for detecting a straight travelling condition of the vehicle is operatively connected to said control means, so that a correction of the steered angle ratio in accordance with the vehicle speed is effected only when said straight travelling condition of the vehicle is maintained for a predetermined period of time.

4,566,711

STEERING SYSTEM FOR VEHICLES

Yusuke Koizumi; Yoshimi Furukawa, both of Saitama, and Shoichi Sano, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,680
Claims priority, application Japan, Oct. 17, 1983, 58-193669
Int. Cl.[4] B62D 7/00
U.S. Cl. 280—91 4 Claims



1. A steering system for vehicles including a steering wheel, a front wheel, means for steering said front wheel, a rear wheel, means for steering said rear wheel, ratio changing means for changing the steered angle ratio of said rear wheel to said front wheel, control means for controlling said ratio changing means, ratio detecting means for detecting the steered angle ratio, said ratio detecting means cooperating with said control means, signal providing means for providing an information signal in relation to the vehicle speed, and said signal providing means cooperating with said control means, in which the steered angle ratio is controlled to be variable in accordance with said information signal, wherein said signal providing means comprises sensor means adapted for detecting the shift position of a speed change gear of the vehicle and connecting to said control means.

4,566,712

STEERING STABILIZER FOR VEHICLES

Donald L. Motrenec, 410 11th St., Huntington Beach, Calif. 92648

Filed Dec. 12, 1984, Ser. No. 680,748
Int. Cl.[4] B62K 21/08
U.S. Cl. 280—272 16 Claims

1. A steering stabilizer for vehicles of the type having at least one steerable front wheel affixed to a front wheel turning assembly controlled by a steering column, said steering stabilizer providing viscous damping to the turning of the front wheel turning assembly thereof, said stabilizer comprising:

a steering column housing affixed to the frame of a vehicle, said housing having a generally cylindrical chamber axially located therein;

a steering column rotatably held axially within said steering column housing; said steering column being affixed to the front wheel turning assembly of the vehicle, said steering column having a threaded portion thereon within said steering column housing;

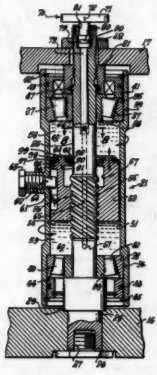
a piston threadably held on the threaded portion of said steering column within said steering column housing, said piston being sealed within said generally cylindrical chamber and being axially slideable within said chamber said piston forming an upper fluid compartment within said chamber above said piston and a lower fluid compartment within said chamber below said piston;

means for preventing the turning of said piston within said generally cylindrical chamber;

oil means sealingly held within said generally cylindrical

chamber said oil means completely filling said upper and lower fluid compartments; and

oil passageway means between said upper and lower compartments, whereby the turning of said front wheel assembly causes said piston to move longitudinally within said generally cylindrical chamber forcing the oil means to pass through said passageway causing viscous damping to the turning of the front wheel assembly.



4,566,713

FOLDING BICYCLE WITH RELEASABLE BRACE ASSEMBLY

David T. Hon, Los Angeles, Calif., assignor to Hon Folder Development Ltd., Los Angeles, Calif.

Filed Jan. 7, 1983, Ser. No. 456,410

Int. Cl.⁴ B62B 7/06

U.S. Cl. 280—287 **19 Claims**

1. In a folding bicycle having a front frame section with front and rear ends, and an elongated folding handlebar assembly rotatably mounted on said frame section to turn about a predetermined steering axis, and including an elongated steering post normally extending upwardly from said front end in an upright steering position and having a lower end that is pivotally connected to said front end for tilting of the post downward to a folded position, an improved brace assembly, comprising:

first and second elongated, longitudinally rigid brace bars having front upper ends that are disposed in side-by-side relation behind the upper end of said post, said brace bars being inclined downwardly and rearwardly toward the rear end of said frame section and diverging laterally to rear lower ends that are spaced apart transversely of said frame section;

a first coupler for releasably joining the upper ends of said brace bars to said post along said steering axis, said coupler comprising a first coupling element secured to said post and defining an axis for the coupler that lies on said steering axis, a second coupling element secured to the upper ends of said brace bars, and manually operable quick-connect and quick-release coupling means for connecting and disconnecting said first and second coupling elements;

and second couplers pivotally connected to said rear end of said frame section in laterally spaced relation to swing about a common transverse folding axis, said second couplers being secured to the rear lower ends of said brace bars to provide a secure base therefor on said frame section against both transverse and longitudinal yielding and to permit downward folding of the brace bars when said first coupler is released.

4,566,714

UNIVERSAL CHASSIS FOR HAULING CONTAINERS

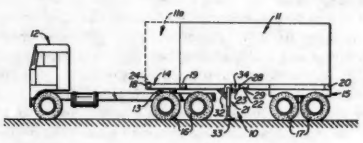
Nick De Witt, Portola Valley, and Lindsey C. Greene, Foster City, both of Calif., assignors to X-Ten Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 491,142, May 3, 1983. This application Sep. 2, 1983, Ser. No. 529,073

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ B62D 53/06

U.S. Cl. 280—404 **3 Claims**



1. A process for adjustably extending a universal shipping container chassis comprising:

providing a rear wheel assembly including a load bearing portion adapted to securely receive and support a first end portion of a shipping container;

providing a fifth wheel assembly including a load bearing portion adapted to securely receive and support a second end portion of said shipping container;

providing an elongate extensible stinger assembly for adjustably coupling said rear wheel assembly to said fifth wheel assembly said stinger including a stinger coupled to one of said rear wheel assembly and said fifth wheel assembly and a tube for receiving said stinger coupled to the other of said rear wheel assembly and said fifth wheel assembly whereby shipping containers of different lengths can be accommodated by said chassis;

placing in said adjustable stinger a plurality of first apertures, said first apertures being vertically and horizontally spaced from each other;

placing in said tubes a plurality of second apertures, said second apertures being spaced vertically to correspond to the vertical spacings of said first aperture;

registering a pin for engaging one of said first apertures and one of said second apertures;

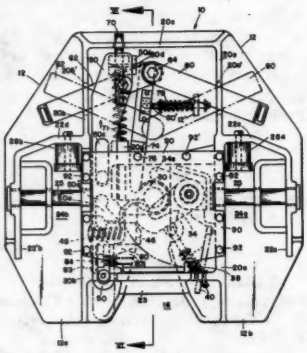
locking said rear wheel assembly;

moving said fifth wheel assembly towards and away from said locked rear wheel assembly until said pin engages one of said first apertures and one of said second apertures to provide a selected extension of said stinger assembly corresponding to a shipping container's length.

4,566,715
FIFTH WHEEL

John T. Buckley, Holland, Mich., assignor to Holland Hitch Company, Holland, Mich.

Filed Aug. 22, 1983, Ser. No. 525,439
Int. Cl.[4] B62D *53/12*
U.S. Cl. 280—434 9 Claims



4. A fifth wheel hitch assembly having a bearing plate with opposite lateral portions and with a rearwardly opening mouth and throat to receive a kingpin having a reduced diameter hitch portion and an enlarged lower head; and a pair of jaws at said throat on the underside of said bearing plate, to receive a kingpin, said jaws having arcuate surfaces to cooperatively receive the reduced diameter portion of the kingpin, one of said jaws being fixed and the other being shiftable between an open position and a closed position relative to said fixed jaw; said shiftable jaw being mounted to shift from an open position to a closed position by a kingpin entering said throat, a locking plunger shiftable between an unlock position and a lock position, in the latter of which said locking plunger lies in the path of said shiftable jaw when closed, to prevent said shiftable jaw from shifting to said open position, and characterized by a fore-to-aft can slide having reset camming means for shifting said locking plunger to said unlock position; said cam slide comprising a plate having a camming slot and pin connection to said locking plunger for said camming means; and actuator means for shifting said cam slide to move said locking plunger to said unlock position.

4,566,716
DEVICE FOR CONNECTING A TRACTOR TO A SEMITRAILER

Bernard Modat, Villette de Vienne, France, assignor to Renault Vehicules Industriels, Lyons, France

Filed Jan. 16, 1984, Ser. No. 571,070
Claims priority, application France, Jan. 14, 1983, 83 00530
Int. Cl.[4] B62D *53/08*
U.S. Cl. 280—439 4 Claims

1. A tractor for a tractor-semitrailer combination, said tractor comprising:

a tractor frame;

a rear tractor axle;

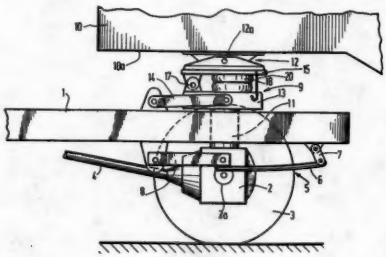
suspension means, including spring means, connected between said rear axle and said frame for supporting said frame and a first link connected to said spring means and articulated to said frame in front of said rear axle;

a fifth wheel adapted for supporting a complementary support element for a semitrailer; and

means for directly supportingly connecting said fifth wheel to said rear axle, whereby said fifth wheel is directly supported by said rear axle, wherein said means for directly supportingly connecting comprise:

(a) means for positioning said fifth wheel substantially directly above said rear axle; and

(b) at least one generally vertically extending support column fixed between said fifth wheel and said rear axle and passing through said frame for supporting said rear

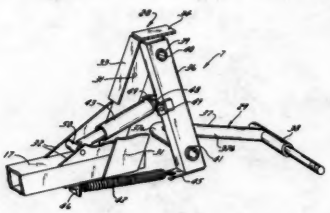


axle, wherein said means for positioning said fifth wheel comprise an arm above each said first link and extending substantially parallel to said first link, each said arm being articulated between said fifth wheel and said frame.

4,566,717
LIGHT TRAILER WITH INDEPENDENT WHEEL SUSPENSIONS

Gregory L. Arthur, Mukwanago, and Wayne E. Hunnicutt, Big Bend, both of Wis., assignors to G & J Industries, Inc., Genesee Depot, Wis.

Filed Mar. 12, 1984, Ser. No. 588,651
Int. Cl.[4] B60G *11/16*
U.S. Cl. 280—701 7 Claims



1. In a trailer having two laterally opposite wheels and having a rigid frame which supports a body and which has a side portion adjacent to each wheel, a shock absorbing independent suspension for each wheel, of the type comprising a rigid wheel arm having a pivotal connection with the frame that defines a laterally extending axis about which the wheel arm swings and carrying a laterally extending axle on which the wheel is rotatable and which is spaced behind said axis so that the wheel can move vertically relative to the frame, said suspension being characterized by:

A. a rigid support fixed on said side portion of the frame and projecting upwardly therefrom, said support having pivot means near its top that defines said axis;

B. said wheel arm being substantially L-shaped and having

(1) an elongated vertical element which has top and bottom ends and which has means near its top end cooperating with said pivot means to provide said pivotal connection, and

(2) an elongated horizontal element which projects rearward from the bottom of said vertical element and to the rear end of which said axle is fixed;

C. said horizontal element being in laterally inwardly offset

relation to said vertical element, and said axle projecting laterally outwardly from said horizontal element, so that the wheel on the axle is rearwardly aligned with said pivotal connection; and

D. shock absorbing means connected between said side portion of the frame and said vertical element, in downwardly spaced relation to said pivotal connection and extending forwardly from the vertical element, for yieldingly opposing swinging motion of the wheel arm out of a position in which said vertical element is oriented substantially vertically and said horizontal element is oriented substantially horizontally.

4,566,718

SUSPENSION AND STEERING CONTROL OF MOTOR VEHICLES

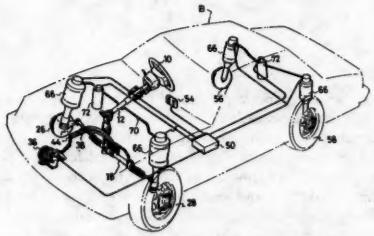
Seita Kanai, and Hirotaka Kanazawa, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 29, 1983, Ser. No. 555,962

Claims priority, application Japan, Nov. 30, 1982, 57-211016; Dec. 16, 1982, 57-220987; Dec. 16, 1982, 57-220988

Int. Cl.[4] B60G *17/08*

U.S. Cl. 280—708 **9 Claims**



1. A motor vehicle comprising: a body, wheels for supporting said body and including steerable wheels, a plurality of suspension means between said body and respective ones of said wheels, manually operated steering means for steering said steerable wheels, said suspension means including variable resistance means for providing resistance to vertical movements of said body with respect to said wheels, first adjusting means for simultaneously adjusting the resistance of all of said resistance means to change the resistance in the same way, second adjusting means for adjusting the operating force necessary to operate said steering means, control means for providing a control signal to said first adjusting means for adjusting the resistance of said suspension means and for providing a control signal to the second adjusting means to adjust the operating force necessary to operate said steering means in predetermined relationship to the adjustment of the resistance of all of the suspension means, and switch means operatively connected to said control means for selectively providing desired adjustment of said variable resistance means and desired adjustment of the force necessary to operate said steering means, whereby the vehicle body movement and the steering force required to turn the steerable wheels can be changed by changing the resistance of the suspension means and the operating force necessary to operate the steering means to selectively provide handling characteristics of vehicles having high suspension resistance and requiring high steering operating force or to provide handling characteristics of vehicles having lower suspension resistance and requiring lower steering operating force.

4,566,719

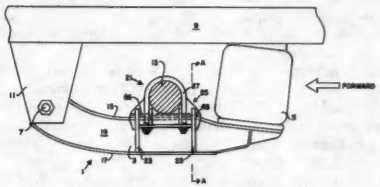
SPACED AXLE-TO-BEAM CONNECTION FOR SUSPENSION OF THE RIGID BEAM TYPE

Ervin K. Van Denberg, Massillon, Ohio, assignor to Turner Quick Lift Corporation, Canton, Ohio

Filed Feb. 17, 1984, Ser. No. 581,128

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—711 **26 Claims**



1. In an axle suspension system of the rigid, longitudinal beam-type for a wheeled vehicle, wherein said longitudinal beam is provided with a first means for connecting the beam to a frame member of the vehicle and a second means for connecting an axle to the beam at a location spaced from said first means, the improvement comprising as said second means, a pair of longitudinally spaced members extending laterally across and being rigidly attached to said beam, and an axle seat having a first and a second surface, said first surface forming a rigid connection with said pair of longitudinally spaced members without contacting the beam, and said second surface rigidly connecting the axle to said axle seat, thereby to provide a rigid axle-to-beam connection in which said axle seat does not come into direct contact with said beam.

4,566,720

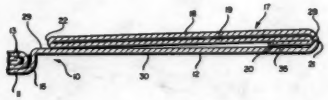
BOOKLET WITH DETACHABLE ENVELOPE

Michael B. Goldman, Deerfield, and Frederick Price, Chicago, both of Ill., assignors to The Wessel Company, Elk Grove Village, Ill.

Filed Jan. 27, 1984, Ser. No. 574,459

Int. Cl.[4] B42D *1/00*; B41L *1/20*; B65D *27/06*

U.S. Cl. 281—15 R **11 Claims**



1. A booklet comprising:

a front cover page;

a back cover page;

a plurality of inner pages;

each page being longitudinally coextensive with the other pages and having inner and outer longitudinal edges;

means securing together all of said inner longitudinal edges along a spine of said booklet;

the outer longitudinal edges of one cover page and of said inner pages being free and unattached;

and a detachable envelope having a back panel, a front panel and a flap;

each of said panels having a pair of lateral edges and first and second longitudinal edges;

said panels being longitudinally coextensive with each other;

the back panel of the envelope being detachable secured to the other cover page of the booklet along a perforated fold line also defining the outer longitudinal edge of the booklet's other cover page and the first longitudinal edge of the envelope's back panel;

said perforated fold line constituting means for folding the envelope into a folded position, when the booklet is closed, on the inside of the other cover page and means for folding the envelope into a folded position, when the booklet is closed, on the outside of the other cover page;

said front panel and said back panel being joined at a longitudinal fold line defining the second longitudinal edge of each;

means securing said front panel to said back panel adjacent their lateral edges;

an envelope opening adjacent the first longitudinal edge of the back panel;

said flap being longitudinally coextensive with said panels and joined to the front panel at a longitudinal fold line defined by the first longitudinal edge of the front panel;

said other cover page having a lateral dimension which is less than the lateral dimension of the one cover page and of the inner pages;

said envelope having a lateral dimension, defined by the lateral distance between the first and second longitudinal edges of the back panel, which is less than the lateral dimension of said other cover page;

the lateral distance between said spine and said perforated fold line being less than the lateral dimension of the one cover page and the inner pages and greater than the lateral dimension of said envelope;

said perforated fold line being indented relative to the outer longitudinal edges of the one cover page and the inner pages, when the other cover page is folded closed and the envelope is folded on the inside of the other cover page, to facilitate thumbing for easy access to the envelope and to the one cover page and inner pages.

4,566,721

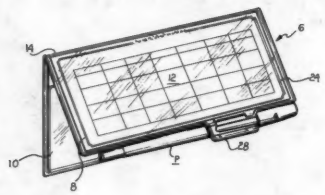
FOLDER WITH REWRITABLE SURFACE FOR CHECKBOOKS AND THE LIKE

Harvey W. Friedman, Longmeadow; Jerry L. Kohli, Feeding Hills, both of Mass., and Cynthia L. DeMur, Enfield, Conn., assignors to Buxton, Inc., Agawam, Mass.

Filed Feb. 9, 1984, Ser. No. 578,553

Int. Cl.[4] B42D *3/00, 3/02, 3/12*

U.S. Cl. 281—31 **1 Claim**



1. Folder for checkbooks and the like comprising a generally rectangular outer ply of transparent, synthetic plastic sheet material, said outer ply having a transversely extending hinge line defined by a plurality of spaced, parallel lands and grooves at approximately its center, at least two pocket-forming inner plies of synthetic plastic sheet material, each disposed in superposed edge-to-edge relation with opposite edge portions of the outer ply and bonded along at least two peripheral edges thereof to the corresponding edges of the outer ply, each of said inner plies having a free inner edge parallel to and on opposite sides of said hinge line to provide access openings into pockets formed between the inner and outer plies and an opaque insert disposed between said outer and inner plies and having indicia imprinted thereon on at least one side, said insert being a unitary rectangular sheet having a transverse fold line which is disposed to register with said hinge line of the outer ply, said insert being slightly smaller than the outer ply of said folder and being formed of a fibrous material treated to be tear resistant despite repeated folding and unfolding along said fold line thereof, said insert being inserted within said pockets such that said indicia are visible when viewed through said outer ply, said synthetic plastic material being receptive to ink applied thereto by a felt-tip pen and being adapted to be wiped clean by a tissue or the like, said folder including as an integral extension thereof, a pen holding tab.

4,566,722

PIPE JOINT CONSTRUCTION FOR REMOTELY CONTROLLED CONNECTION AND DISCONNECTION

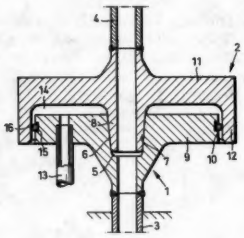
Johann Huber, and Lutz Lorenz, both of Dortmund, Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,809

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346069

Int. Cl.[4] F16L *17/02*

U.S. Cl. 285—18 **5 Claims**



1. Pipe joint comprising a female pipe end having an axially extending tubular passage and a male pipe end engageable with said female pipe end and having an axially extending tubular passage in general axial alignment with said female pipe end tubular passage, said female pipe end having a conically shaped engagement surface and said male pipe end having a correspondingly shaped engagement surface for engagement with said engagement surface on said female pipe end, remotely controllable means for connecting and disconnecting said female and male pipe ends, each of said female pipe end and male pipe end having an end surface extending transversely of the axial direction of the tubular passages therethrough, said end surfaces combining to form a chamber when said conically shaped engagement surfaces are in contacting engagement, and means for establishing a vacuum within said chamber for placing said conically shaped engagement surface in closely fitting relation and for introducing a pressurized medium into said chamber for displacing said conically shaped engagement surfaces axially apart.

4,566,723

COUPLER FOR HOSE LINES OF HIGH-PRESSURE CLEANING AND SPRAYING EQUIPMENT

Werner Schulze, Winnenden-Höfen; Josef Gerich, Winnenden; Emil Scheef, Waiblingen, and Heinz Dautel, Backnang, all of Fed. Rep. of Germany, assignors to Alfred Kärcher GmbH & Co., Winnenden, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 512,938

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226571

Int. Cl.[4] F16J *15/00*

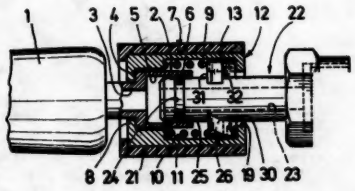
U.S. Cl. 285—86 **8 Claims**

1. A coupler for hose lines of high pressure cleaning equipment and high-pressure spraying equipment comprising

a nipple attached to the end of a first hose and having an inner throughhole forming an inner sealing surface, said nipple being surrounded by a sleeve which is open at its end facing a second hose, secured against displacement in

the direction of the second hose, and bears on its inner side catch projections which extend into the interior of said sleeve and are separated by a wall area free of said catch projections, said catch projections characterized by a recess on the side facing the first hose which has a surface inclined in relation to the longitudinal axis of said sleeve,

a connecting piece attached to the end of the second hose and having an outer sealing surface which lies in sealing contact with the inner sealing surface of said nipple when said connecting piece is inserted into said nipple, said connecting piece having on its outer wall outwardly projecting catches which are complementary to the catch projections of the sleeve, extending circumferentially over an area maximally as great as the area on the inner wall of the sleeve free of the catch projections, and which have



on their side facing the second hose, locking lugs which slip into the recesses in the catch projections of said sleeve, and

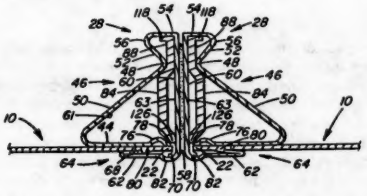
a compression spring between said nipple and said connecting piece, characterized in that the compression spring is located between the inner wall of the sleeve and the nipple and is supported by an inward projection of the sleeve adjacent the first hose and by the catch projections on the connecting piece, said projections having locating faces for the compression spring against which the compression spring rests when the connecting piece is inserted into the sleeve the locking lugs on the catches on the connecting piece being bounded on their front edge relative to the direction of turning by a surface inclined relative to the longitudinal axis of the connecting piece towards its free end.

4,566,724

DUCT JOINT FRAME

Peter J. Arnoldt, Clairton, Pa., and Waldemar H. Greiner, Hamilton, Canada, assignors to Ductmate Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,415
Int. Cl.⁴ F16L *23/00*
U.S. Cl. 285—364 **18 Claims**



1. A duct joint frame for connection to the end portion of a generally rectangular duct comprising,

a plurality of flange members,

each of said flange members having a front wall, said flange members formed by a thin walled sheet of material including a first leg having an end portion and a second leg having an end portion,

said first leg end portion being laterally spaced from said second leg end portion,

said leg portions beng bent relative to one another to form a plurality of wall sections,

a first wall section terminating at said first leg end portion,

a second wall section terminating at said second leg end portion,

said first and second wall sections being positioned in overlying relation to receive an end portion of a duct therebetween,

said first wall section including an abutment shoulder for receiving and restraining forward advancement of the duct end portion between said first and second wall sections,

said abutment shoulder abutting a portion of said second wall section at a fixed distance from the front wall of said flange member,

said second leg end portion forming stop means for engaging protuberances on the surface of the duct adjacent the duct end portion to prevent retraction of the duct end portion from between said first and second wall sections, and

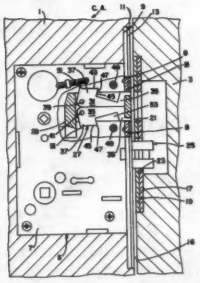
said stop means being laterally spaced a fixed dimension from said abutment shoulder to maintain the duct end portion rigidly secured between said stop means and said abutment shoulder with said duct end portion a preselected fixed distance from said flange member front wall and said duct end portion connecting said first leg end portion to said second leg end portion and rigidifying said flange member.

4,566,725

DEADLOCK MECHANISM

David Klein, Montreal, Canada, assignor to Almet Hardware Limited, Canada

Filed Feb. 10, 1984, Ser. No. 579,193
Claims priority, application Canada, Jan. 30, 1984, 446296
Int. Cl.⁴ E05C *5/02*
U.S. Cl. 292—191 **6 Claims**



1. A deadlock assembly for mounting in a closure member for locking the closure member to an associated frame, the assembly comprising:

(a) a casing including a facing plate provided with a bolt aperture, and having an inner wall portion circumscribing the aperture;

(b) a bolt having a longitudinal axis and mounted within the casing for reciprocal movement along the longitudinal axis between an unlocked rearward position wherein the bolt is disposed within the casing and a locked forward position wherein the bolt extends out of the casing through the bolt aperture;

(c) a pair of levers, the levers being disposed on opposite sides of the longitudinal axis, with each lever including a forward end provided with a locking ear and a rearward end provided with a camming lug spaced from the locking

ear, the locking ear and camming lug extending laterally away from the longitudinal axis;

(d) means for mounting the rearward end of each lever on the bolt for pivotal movement about an axis extending transversely of the longitudinal axis;

(e) each camming lug being configured to define, when the bolt is moved to the unlocked rearward position, a longitudinal camming edge disposed substantially parallel to the longitudinal axis and a rearward inclined radial camming edge, the longitudinal and radial camming edges converging to form a cammng point for engaging the inner wall portion; and

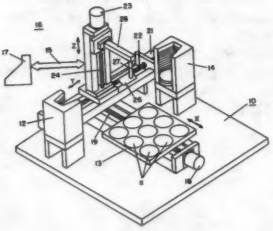
(f) a cam follower means disposed within the casing on either side of the levers and spaced from the inner wall portion, each cam follower means being positioned to engage the longitudinal camming edge of a corresponding camming lug for maintaining the longitudinal camming edge parallel to the longitudinal axis until the camming point engages the inner wall portion, thereby causing the locking ear to be moved away from the longitudinal axis when the bolt is moved towards the locked forward position.

4,566,726

METHOD AND APPARATUS FOR HANDLING SEMICONDUCTOR WAFERS

Albert D. Correnti, Hamilton Township, Mercer County, and James Potechin, Cranbury, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 13, 1984, Ser. No. 620,247
Int. Cl.⁴ B66C *1/02*
U.S. Cl. 294—64.3 **10 Claims**



1. A wafer pickup device for handling a semiconductor wafer comprising:

means for lifting and supporting the semiconductor wafer on a flow of pressurized fluid utilizing the Bernoulli effect; and

means for gently contacting a plurality of predetermined portions of the wafer by means of a vacuum so that once the flow of pressurized fluid is interrupted, the wafer is held at its predetermined portion only by the vacuum.

4,566,727

ROBOTIC GRIPPER

Lawrence F Yuda, P.O. Box 176, Westminster, S.C. 29693

Continuation of Ser. No. 472,714, Mar. 7, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,861
Int. Cl.⁴ B25B *15/08*
U.S. Cl. 294—88 **1 Claim**

1. A robotic gripper having a cylinder within a housing containing a fluid actuator supplying a limited axial power stroke to a clevis bracket carried within a reduced portion of the housing comprising:

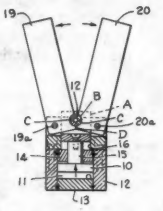
a transverse cylindrical bushing carried within said clevis bracket;

said cylindrical bushing having a shaft extending from each end and being journated within said clevis bracket;

a pair of opposed fingers each pivotally mounted adjacent one end thereof within said housing on opposite sides of said bushing about spaced respective pivot points;

said fingers having opposed surfaces each having an arcuate recess therein substantially entirely conforming to and receiving said bushing; and

a relieved portion on each of said fingers carried within said housing extending from said arcuate recesses tapering outwardly to an extent that outward movement of said fingers is permitted through a full power stroke of said fluid actuator; and



said bushing and said pivot points being in substantial alignment when said fingers are approaching closed position with said opposed surfaces tapering outwardly permitting further forceful movement of the bushing beyond the pivot points providing overgripping and forceful engagement of the oppose tapering surfaces of the fingers;

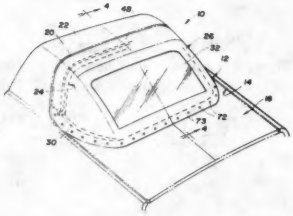
whereby said relieved portions may act as stops to limit further opening of the fingers.

4,566,728

HATCHBACK VEHICLE BODY INCLUDING HATCH HAVING OPENING WITH SOFT TOP CONVERTIBLE CLOSURE

Chris P. Theodore, Whitmore Lake, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed Jul. 13, 1984, Ser. No. 630,703
Int. Cl.⁴ B62D *25/00*
U.S. Cl. 296—76 **8 Claims**



1. In a vehicle body including a rear hatchback having a rear opening in the vehicle body and also having a rear hatch mounted for movement between open and closed positions with respect to the rear opening, the invention comprising: a hatch opening in the rear hatch; said hatch opening having side edges and also having front and rear edges between which the side edges extend; a soft top convertible closure mounted on the rear hatch and movable between closed and open positions with respect to the opening thereof; the convertible closure including a frame movable between raised and stored positions; said frame including a main bow having opposite ends pivotally mounted on the hatch adjacent the side edges of the hatch opening; said frame also including an auxiliary bow having opposite ends pivotally mounted on the main bow; the convertible closure also including a soft top that is moved between the closed and open positions thereof upon movement of the

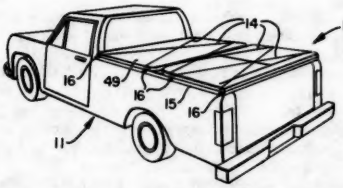
frame between the raised and stored positions; the soft top having a front edge secured to the main bow and having a rear edge secured to the hatch adjacent the rear edge of the opening in the hatch; and a connection that secures the soft top to the auxiliary bow with the auxiliary bow being movable to an overcenter position on the main bow with the frame in the raised position to position the soft top in the closed position.

4,566,729

QUICK ERECTION TENT FOR PICKUF TRUCKS

Toney L. Magnino, 1821 Burning Tree La., Carrollton, Tex. 75006

Filed Oct. 9, 1984, Ser. No. 658,565
Int. Cl.[4] B60P *3/32*
U.S. Cl. 296—159 **20 Claims**



1. A quick erection tent mountable and useable above the bed of vehicles comprising: a quick erection tent with a base frame having opposite side frame members and opposite end frame members mountable on the tops of a vehicle bed side and front walls with the rear end frame member fastened to the rear ends of said opposite side frame members and spanning the space between said opposite side members and with storage beneath the tent structure accessable when a tail gate is open even with the tent mounted on the vehicle in both the erected state and collapsed flat stowed state; bolt and washer means extended through sides of said base frame engaging vehicle wall flanges for fastening said tent base in place on said vehicle; front and rear "U" shaped tent supporting brackets pivotally mounted on the front and rear of said tent base frame for pivotal movement from the folded down collapsed state to the vertical erected state for tent erection and return back to the folded down collapsed state to return the tent to the collapsed stowed state; spacer bar means pivotally connected to said front "U" shaped tent supporting bracket and having connection means for connection to said rear "U" shaped tent supporting bracket; flexible resiliently extendable front and rear cross tie means connected, respectively, from the rear of said base frame to the top portion of said front "U" shaped tent supporting bracket, and from the front of said base frame to the top portion of said rear "U" shaped tent supporting bracket; and a fabric tent enclosure supported by said "U" shaped tent supporting brackets in the tent erected state.

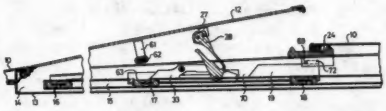
4,566,730

SLIDING ROOF FOR VEHICLES

Martin Knabe, Berlin, and Wolfgang Anzenhofer, Olching, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,716
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238454
Int. Cl.[4] B60J *7/00*
U.S. Cl. 296—221 **28 Claims**

25. In a roof assembly of the type wherein a rigid cover is slideably displaceable between positions closing and opening an opening in the roof of a vehicle, and is displaceable by a tilt-out mechanism in a pivotable manner, from the closed position, about a transverse axis disposed in the vicinity of a front edge of the panel, upwardly to a first position and downwardly to a second position and having the improvement for providing stable guidance and suppression of tendencies to vibrate and rattle, comprising said tilt-out mechanism having, at each side of the roof opening, a single tilt-out lever, that is pivotally connected to the cover, a link that is displaceable in the sliding direction of the cover and is connected to the tilt-



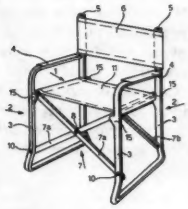
out lever in a manner permitting relative pivoting and sliding motions therebetween, and a forcing guide means, that is operative at least in a range of movements of said cover from said closed position to said second position, for creating a three-point interconnection between the tilt-out lever and the link that eliminates play between the link and the tilt-out lever.

4,566,731

DISMOUNTABLE FOLDING CHAIR

Sisto Marchesini, Vicenza, Italy, assignor to Royal Plastic S.A., Riva San Vitale, Switzerland

Filed May 24, 1984, Ser. No. 613,282
Claims priority, application Italy, May 27, 1983, 21337 A/83
Int. Cl.[4] A47C *4/28*
U.S. Cl. 297—45 **8 Claims**



1. A folding chair comprising:

two side frames, each side frame including interconnected front and rear legs, an armrest, and upright portions for supporting a backrest;

four elongated members, two of said four elongated members each being pivotably mounted at one end to a different one of said front legs and the other two of said four elongated members each being pivotably mounted at one end to a different one of said rear legs, said two elongated members crossing over one another and said other two elongated members crossing over one another, the other end of said four elongated members including a first connecting means, said first connecting means having a fork-shape portion;

second connecting means defined by each of said front legs and each of said rear legs, said second connecting means having a fork-shaped portion; and

two side bars, each side bar interconnecting the second connecting means of one rear leg with the second connecting means of an opposed front leg and portions of each of said side bars having a diameter greater than the distance between the ends of the tongs of said fork-shape portion of said second connecting means for releasably holding said side bar within said second connecting means and other portions of each of said side bars having a diameter greater than the distance between the end of the tongs of said fork-shape portion of said first connecting means for releasably holding said side bars within said first con-

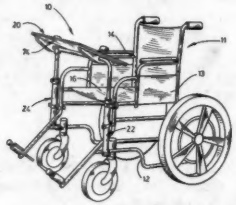
necting means when said side bars are releasably held by said second connecting means.

4,566,732

ADJUSTABLE WHEELCHAIR TABLE

James R. Ostergaard, II, and Dwight L. Donaldson, both of Fresno, Calif., assignors to James R. Ostergaard, Sr., Fresno, Calif., a part interest

Filed Dec. 27, 1983, Ser. No. 565,889
Int. Cl.[4] A47B *39/00*
U.S. Cl. 297—174 11 Claims



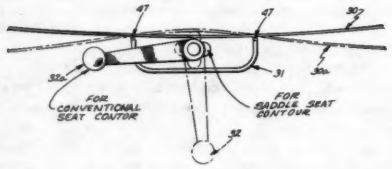
1. A table for use with a wheelchair having a frame supported on wheels and mounting a seat portion adapted to support a person thereon, the table comprising a table portion having a substantially flat surface; and a mounting assembly adapted detachably to mount the table portion on the wheelchair and having a portion adapted to define a substantially horizontal first pivotal axis and the table portion is adapted to be mounted on the mounting assembly for pivotal movement thereof about said first pivotal axis and the mounting assembly having a portion adapted to define a second pivotal axis substantially normal to the first pivotal axis and the table portion is adapted to be mounted for pivotal movement thereof about said second pivotal axis.

4,566,733

CHAIR FOR WORK ENVIRONMENT

Arthur M. Compton, Grand Rapids YMCA, 33 Library St., Grand Rapids, Mich. 49503

Filed Nov. 28, 1983, Ser. No. 555,815
Int. Cl.[4] A47C *3/00, 7/14*
U.S. Cl. 297—284 5 Claims



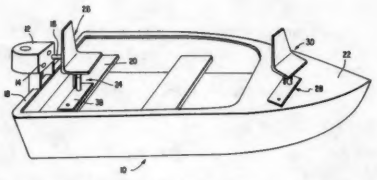
1. A chair seat construction comprising: a flexible seat plate, U-shaped structural member extending fore and aft of the seat plate, a pair of hinges, each hinge pivotally joining the longitudinal upper edge of one leg of the U-shaped structural member to the seat plate, a cam means operatively interconnected between the seat plate and the U-shaped structural member for flexing the seat plate and varying its contour, and an actuation means located mainly outside the U-shaped structural member and operatively connected to said cam means so that said cam means may be actuated to flex the seat plate and thereby change its contour.

4,566,734

ADJUSTABLE BOAT SEAT PEDESTAL

Andrew L. Bruner, 5924 Chaucer La., Little Rock, Ark. 72209

Filed Aug. 24, 1984, Ser. No. 643,721
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—346 9 Claims



1. A mounting pedestal for a boat seat movable between an elevated seating position and a lowered seating position comprising:

a base adapted to be secured to said boat, said base including a first, open-ended tube the axis of which is vertically oriented;

a mounting plate adapted for connection to a seat, said mounting plate having a second, downwardly extending, open-bottomed tube affixed thereto;

a column assembly including a first cylindrical member adapted to be telescopingly received in and secured to said tube, a second cylindrical member, and a third cylindrical member adapted to be telescopingly received in said first tube, said first and second members and said second and third members, respectively, being pivotally connected, the connection between said first and second members being such as to maintain said seat in a seating position in both the upper and lower positions thereof; and

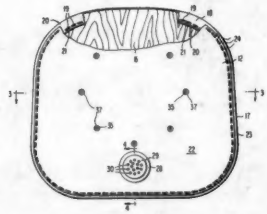
a tubular sleeve telescopingly received over said column assembly, the length of said sleeve being less than that of said column member.

4,566,735

UPHOLSTERED SEAT FOR CLEAN ROOMS

James W. Frobose, Haskins, Ohio, assignor to The Jasper Corporation, Easton, Md.

Filed Nov. 15, 1983, Ser. No. 551,913
Int. Cl.[4] A47C *7/18*
U.S. Cl. 297—452 3 Claims



1. In upholstered furniture for industrial clean rooms, a body support portion comprising a substantially rigid panel member, a yielding cushion on and substantially covering one face of said panel member, an air impermeable sheet material cover for said body support portion surrounding and enclosing said panel member and cushion and being in hermetically sealed relationship to said panel member, said panel member and cover sheet having registering openings formed therethrough, a filtering means within said registering openings and being in hermetically sealed relationship with the panel member and said cover, said filtering means including an apertured filtering element housing, and a filtering element held within said hous-

ing in covering relationship to the apertures thereof and being formed as a disc of thin hydrophylic sheet material capable of preventing the passage therethrough of particles substantially as small as 0.2 microns.

4,566,736

APPARATUS FOR MECHANICALLY BREAKING UP ROCK

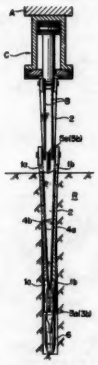
Shigetake Akanuma, Chigasaki; Minoru Nakajima, Hiratsuka; Satoshi Takashima, Kanagawa; Haruo Imamura, Hiratsuka; Yoshitaka Ojiro, Hiratsuka; Hiroshi Kakuta, Hiratsuka, and Masato Matsumoto, Minami-ashigara, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,582

Claims priority, application Japan, May 10, 1983, 58-68484[U]

Int. Cl.⁴ E21C *37/06, 37/02*

U.S. Cl. 299—23 **8 Claims**



1. A wedge type rock breaking apparatus comprising wedge guide members divided into halves and adapted to be inserted into a hole which has previously been drilled in the rock to be broken up, said haves defining oppsite respective divided surfaces; a slider wedge adapted to be thrusted in between said wedge guide members to thereby spread or move the latter away from each other; and a pair of dust-proof membranes adapted to be attached across both ends of the opposite respective divided surfaces of said wedge guide members, chartacterized by that said dust-proof membranes each have projections formed as an integral unit along both longitudinal sides edges thereof, each of said projections being adapted to be thrusted into each of longitudinally extended grooves of "C"-shaped cross-section formed along the respective divided surfces of said wedge guide members on both sides thereof and whose both side surfaces extend at right angles to the bottom surface therof.

4,566,737

ANTISKID CONTROL WITH WHEEL-SPEED DIFFERENCE COMPENSATION

Syouichi Masaki; Kimio Tamura, both of Anjo; Teruyoshi Wakao, Nagoya; Noriyuki Nakashima, Nagoya; Ken Asami, Nagoya, and Kazunori Sakai, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kairya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 8, 1984, Ser. No. 638,720

Claims priority, application Japan, Aug. 9, 1983, 58-145258

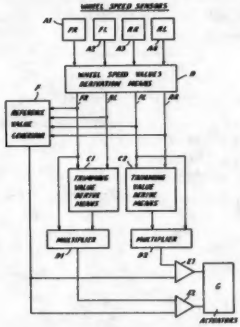
Int. Cl.⁴ B60T *8/68*

U.S. Cl. 303—109 **13 Claims**

1. An antiskid control system for the hydraulic braking system of a wheeled vehicle having at least first and second wheels, first and second wheel speed sensors respectively associated with said wheels, and means for decreasing the fluid pressure of the braking system in response to a pressure control signal applied thereto, comprising:

means for deriving from the outputs of said wheel speed sensors first and second wheel speed values respectively representing the rotational speeds of said first and second wheels;

means for deriving a trimming value from the difference between said first and second wheel speed values;



means for multiplying said first wheel speed value by said trimming value to compensate for the deviation of the speed of said first wheel from the speed of said second wheel; and

means for comparing said compensated first wheel speed value with a variable threshold that is a function of the speed of said vehicle and generating said pressure control signal.

4,566,738

POSITIONING APPARATUS

Ulf K. F. Fasth, Skolgatan 14, S-302 32 Halmstad, Sweden

Filed Oct. 12, 1983, Ser. No. 541,135

Claims priority, application Sweden, Oct. 19, 1982, 8205923

Int. Cl.⁴ F16C *29/00, 29/02*

U.S. Cl. 308—3 A **5 Claims**

1. In an improved positioning apparatus comprising an elongate housing formed from a lightweight metal and defining an axially extending internal cavity, a threaded spindle rotatably mounted in said internal cavity of said housing and extending axially therein, a runner mounted on said spindle and threaded thereto for longitudinal movement in response to rotation of said spindle, a member fixed axially on said runner at least in part within said housing and projecting outwardly therefrom in the transverse direction of said positioning apparatus, at least three spaced longitudinally extending guide members arranged

in said housing around and parallel with said spindle and said internal cavity, at least two of said guide members being formed at opposite corners of said housing on one side of a plane containing the axis of said spindle, at least one of the remaining of said guide members being positioned on the opposite side of said plane and lying on a plane perpendicular to the first mentioned plane and containing said spindle axis, said runner traveling backwards and forwards in said housing cavity along said guide members, said guide members being integral parts of said housing, means forming bearing slide surfaces on said guide members and engaged with said runner member projection for reducing friction on said runner's movement on said slide surfaces.

4,566,739

CROSS-SLIDE GUIDE FOR A MICROFILM READER

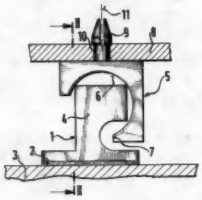
Andrzej Walczak, Ober-Morlen, Fed. Rep. of Germany, assignor to Map Mikrofilm Apparatebau Dr. Poehler GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,271

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328800

Int. Cl.[4] F16C *29/02*

U.S. Cl. 308—3 R **6 Claims**



1. A cross-slide guide in which slides located on sliding pads can be traversed on at least one guide rail on which they are supported, the cross-slide guide comprising:

(a) at least one elongated guide rail having, at the upper portion thereof, a guide section of greater width than height with rectangular cross-section, and having an undercut on at least one side below said guide section;

(b) a sliding pad having an inner arcuate guide surface slidingly resting on said guide section and embracing the guide section in such a manner that said guide surface makes contact only with the two upper longitudinal edges of the guide section, and having a lower portion reaching under the guide section into said undercut with clearance between said guide rail and said guide surface.

4,566,740

KINETIC WHEEL ARRANGEMENT INCORPORATING MAGNETIC SUSPENSION PROVIDED WITH MEANS FOR CAGING ITS ROTOR

Jean F. Beau, St. Ouen-L'Aumone, and Michel Gauthier, Verneuil-Sur-Seine, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Jul. 9, 1984, Ser. No. 629,215

Claims priority, application France, Jul. 19, 1983, 83 11903

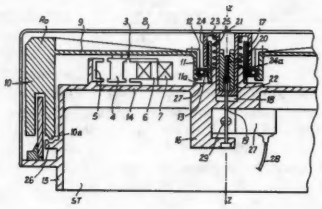
Int. Cl.[4] F16C *39/00*

U.S. Cl. 308—10 **10 Claims**

1. In a kinetic wheel arrangement comprising a stator, a rotor and a magnetic suspension formed by cooperating parts respectively connected to the stator and to the rotor to be adapted to suspend the rotor magnetically with respect to the stator, the axis of rotation of the rotor being defined by the stator,

said rotor comprises a central recess about said axis of rotation,

there is disposed in said central recess of the rotor a pressure system provided with a screw which is connected to the stator and of which the axis merges with said axis of rotation of the rotor, this pressure system being adapted to take a first position for which said rotor is free to rotate



about its axis of rotation whilst being suspended by its magnetic suspension, and a second position for which it presses said rotor against said stator to immobilize it,

and remotely-controlled means are provided to cut said screw between said stator and said rotor.

4,566,741

SUPERVISORY DESK

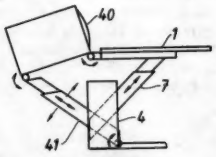
Stig Eriksson; Bengt Granberg, and Erik Westberg, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Division of Ser. No. 413,827, Sep. 1, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,340

Claims priority, application Sweden, Sep. 4, 1981, 8105258; May 3, 1982, 8202760

Int. Cl.[4] A47B *17/02*

U.S. Cl. 312—194 **5 Claims**



1. A supervisory desk, comprising a top section having a front edge, a stand section having at least one leg of adjustable length which supports said top section for adjustment in height thereof relative to said stand section, said at least one adjustable leg inclined in a forward direction relative to a vertical plane at an angle between 15° and 75° such that said front edge of said top section moves in said forward direction relative to said stand section upon an increase in the length of said at least one adjustable leg, and a display unit pivotally mounted on said top section, a support leg of variable length inclined in a rearward direction and having an upper end and a lower end, said lower end pivotally mounted on said stand section, and said upper end pivotally mounted to said display unit.

4,566,742
CONSTRUCTION SET FOR THE ERECTION OF MOUNTING STRUCTURES

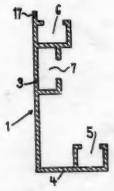
Samuel Schmied, Uetendorf, Switzerland, assignor to S. Schmied & Co., elektrotechnische Bedarfsartikel en gros, ASM-Tableaubau, Uetendorf, Switzerland

Filed Jan. 6, 1984, Ser. No. 568,640

Claims priority, application Switzerland, Jan. 10, 1983, 108/83

Int. Cl.⁴ A47B *43/00*

U.S. Cl. 312—257 SK **13 Claims**



1. A construction set for erecting a mounting structure, comprising first wall-forming members having a cross-section which includes first and second branches and a corner, said first and second branches extending from said corner in mutually perpendicular directions, said second branch being longer than said first branch and forming a wall of said mounting structure, said first branch extending generally parallel to a first plane and including a groove having an opening directed generally orthogonally with respect to said first plane, said second branch extending generally parallel to a second plane and having a first groove with an opening directed generally parallel with respect to said second plane and a second groove disposed between the first groove and said corner, said second groove having an opening directed generally orthogonally with respect to the second plane, mounting members operable for mounting a first means on said mounting structure by means of fasteners, wherein the groove of said first branch is positioned to support said mounting members at a predetermined depth in said mounting structure.

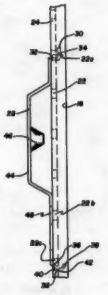
4,566,743
DRAWER SLIDE CLIP

Jay M. Henriott, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jun. 11, 1984, Ser. No. 619,027

Int. Cl.⁴ A47B *88/00*

U.S. Cl. 312—350 **5 Claims**



1. A drawer slide clip detachably connectable to a track having a plurality of apertures, the clip comprising:

a body having opposite ends;

tab means, at one of said ends, for engaging a selected aperture in the track so as to correctly position the clip relative to the track;

clip means, at the other of said ends, for engaging a selected aperture so as to detachably connect the drawer slide clip to the track, said clip means including a flexible leg having an attachment cam surface means for engaging an inner peripheral edge of its corresponding aperture and flexing said leg upon the exertion of force towards the track to permit said leg to enter the corresponding aperture, said leg further having detachment cam surface means for engaging an inner peripheral edge of the corresponding aperture and flexing said leg upon the exertion of force away from the track thereby permitting said leg to disengage from the corresponding aperture; and

engagement means for engaging a drawer slide.

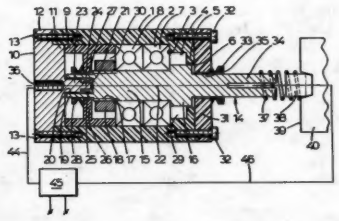
4,566,744
CURRENT COLLECTOR FOR ROTATING SHAFT

Hendrik v Engelenburg, Driebergen, Netherlands, and Rugerus S. Heemskerk, Pfandhausen, Fed. Rep. of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Jun. 28, 1983, Ser. No. 508,611

Int. Cl.⁴ H01R *39/00*

U.S. Cl. 339—8 L **20 Claims**



1. In a current collector, provided with a housing, wherein is rotatably supported an electrical contact shaft which, by an end projecting from one end of the housing, may be brought into contact with an independently rotating shaft in order thereby to be brought into rotation and likewise make electrical contact therewith, where mercury is contained in the housing in order to bring about electrical connection between the contact shaft and a contact member attached in the housing, the improvement wherein the housing is closed off at its other end by a removable sealing cover, the contact shaft having a terminal part which faces the sealing cover, the terminal part having a cylindrical blind hole which is coaxial with the contact shaft, means fixedly provided on said cover for sealing the hole and forming a closed space for the mercury when said cover is fastened to said housing, said closed space being subject to addition and removal of said mercury upon separation of said sealing cover from said housing.

4,566,745
CONNECTOR ASSEMBLY

Ronald R. Maros, Itasca, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 20, 1984, Ser. No. 642,384

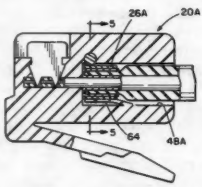
Int. Cl.⁴ H01R *13/652*

U.S. Cl. 339—14 P **10 Claims**

1. A connector assembly for use in interconnecting a pair of electrical components, said assembly comprising:

a connector including an insulative housing defining a connection chamber and a cable-receiving passageway communicating with said chamber, and further including at least one metallic terminal element disposed in said chamber, said element having a conductor termination portion and a component connection portion;

a shielded cable disposed in said passageway, said cable including a metallic conductor engaged by said conductor termination portion with a metallic shield disposed about and insulated from said conductor and an insulative jacket disposed about said shield;



a resilient metallic band, at least partially encompassing said cable and engaging a portion of said shield folded back over said jacket, disposed in said passageway and electrically isolated from said terminal element; and

a metallic grounding pin extending inside said passageway and compressing said band.

4,566,746

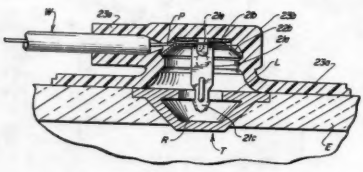
ELECTRICAL CONNECTOR

Ervin J. Hobson, Chicago, Ill., assignor to Hobson Bros., Inc., Chicago, Ill.

Filed Jun. 5, 1984, Ser. No. 617,398

Int. Cl.[4] H01R *11/22*

U.S. Cl. 339—60 R **14 Claims**



1. An electrical connector for use with a surface-mounted terminal in a high voltage circuit, the terminal having a recess provided with an inwardly projecting lip deliminating an entry to the recess, said connector comprising a clip of electrically conductive material and having a pair of elongated protruding elements connected at one end by a bail section, the opposite end portions of said elements being free and adapted to extend into the terminal recess entry and make resilient interlocking electrical contact with the terminal lip; an insulated electrical lead having a bare conductor end portion straddled by the coaction of said bail section and adjacent portions of said protruding elements; a shield member having a portion thereof disposed intermediate the protruding elements of said clip and coacting with the clip bail section to resiliently sandwich therebetween the bare conductor end portion of said lead and make electrical contact therewith; and an insulated cover piece accommodating said clip, said shield member, and an insulated segment of the electrical lead and the bare conductor end portion extending therefrom; said cover piece including an inner skirt section encompassing the clip protruding elements and being adapted to overlie and resiliently engage a portion of the surface circumjacent the terminal, and an outer section protruding from said skirt section, said outer section being provided with an interior cavity having an open side adjacent said skirt section, and an opening for accommodating the insulated segment of the electrical lead, said opening having an exposed outer end and a restricted inner end communicating with said cavity; said cavity being provided with protruding means in offset spaced relation relative to the opening inner end and in resilient interlocking engagement with a peripheral portion of said shield member and retaining the bare conductor end portion in resilient sandwiched relation between said shield member and said clip bail section and in electrical contact therewith.

4,566,747

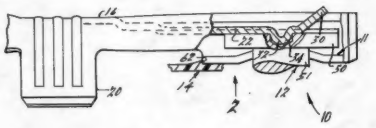
ELECTRICAL CONNECTION SYSTEM

Robert P. Peers, Rochester, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Jul. 26, 1984, Ser. No. 634,605

Int. Cl.[4] H01R *13/635*

U.S. Cl. 339—74 R **6 Claims**



1. An electrical connection system comprising a fixed post-type male terminal having a T-shaped end portion defined by a post having a relatively larger diameter flange at the end thereof, and a female connector of hollow parallelepiped configuration comprising a top wall, a bottom wall and spaced side walls defining an opening for the acceptance of the flange of said male terminal, the bottom wall of said female connector comprising two spaced cutout portions for the acceptance of the post of the male terminal, the spacing of the cutouts in the bottom wall of said female connector being smaller than the flange on the end portion of said male terminal to preclude movement of the female connector away from the male terminal in a direction parallel to a central longitudinal axis of said male terminal, said female connector having means at one end thereof for attachment to a flexible electrical conductor and an elastically deflectable locking tab in the top wall thereof provided with means engageable with said male terminal to effect locking therewith.

4,566,748

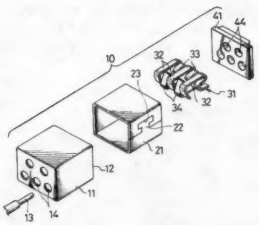
CONNECTOR

Tokio Tanishi, Mie, and Hideki Yokoyama, Tsu, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 17, 1984, Ser. No. 651,259

Int. Cl.[4] H01R *9/24*

U.S. Cl. 339—95 D **12 Claims**



1. A connector comprising a casing of a tubular shape open at one end and bottomed at the other end, contact means of a tubular shape having both open ends and assembled inside said casing with said both open ends disposed adjacent said open and bottomed ends of the casing, a plurality of resilient means arranged within said contact means to be in parallel to a direction of inserting the contact means into the casing for holding respective wire ends to be interconnected at a position between said resilient means and an inner surface of the contact means, a lid secured to said open end of the casing, and means provided in one of the bottomed end of the casing and said lid to

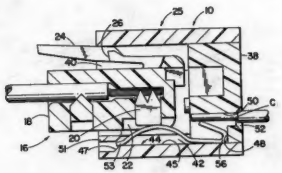
be opposed to respective said resilient means for inserting said wire ends respectively into said holding position, said resilient means comprising respectively an elongate strip bent to have at one end of a central flat portion an S-shaped resilient portion and at the other end of said flat portion a wedge portion sloped to be on the side of said resilient portion, said wire ends respectively being held resiliently in said holding position by free ends of said resilient and wedge portions.

4,566,749

ELECTRICAL CONNECTOR RECEPTACLE

James J. Johnston, Old Saybrook, Conn., assignor to Brand-Rex Company, Willimantic, Conn.

Filed Aug. 9, 1984, Ser. No. 639,242
Int. Cl.[4] H01R *11/05*
U.S. Cl. 339—95 D 11 Claims



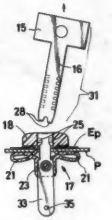
1. An electrical connector receptacle comprising a dielectric housing having top, bottom, side, and rear walls defining a generally rectangular longitudinally extending forwardly opening plug receiving cavity, said bottom and rear walls cooperating to define a plurality of contact receiving channels communicating with said plug receiving cavity, each of said channels having an upwardly facing lower surface including a main portion and a ramp portion forming a first junction with said main portion and inclined forwardly and downwardly from said first junction and away from said main portion, a pair of opposing side surfaces and a forwardly facing rear surface forming a second junction with said lower surface, said rear wall further defining an upper surface of each of said channels, a plurality of unitary resilient spring contact members supported in generally parallel side-by-side relation to each other within said housing, each of said contact members being disposed within an associated one of said channels between said side surface thereof, each of said contact members having a front end portion supported on said main portion proximate said first junction and inclined upwardly and rearwardly from said main portion, an arcuately upwardly bowed contact portion integrally connected at its forward end to the rear end of said front end portion for engaging an associated plug contact on a plug having a body supporting the plug contact and received within said cavity, a rear transitional portion integrally connected at its forward end to the rear end of said contact portion and extending downwardly and rearward therefrom, said transitional portion including an upwardly reversely bent rear end portion supported at said second junction by said lower surface and said forwardly facing rear surface, and a rear terminal portion integrally connected at its rear end to a forward end of said reversely bent rear end portion and extending generally forwardly and upwardly away from said second junction and terminating at a free end, said free end exerting biasing force upon said upper surface, and a plurality of connector receiving apertures extending through said rear wall, each of said apertures communicating with an associated one of said channels said front end portion of each contact member engaged with an associated contact on a plug received within said housing being supported by said main portion, said front end portion of each contact member engaged with an associated portion of the body of a plug received within said cavity being generally supported by said ramp portion forward of said first junction.

4,566,750

PLASTIC INSERT-MOLD ELEMENT CONTAINING A METAL-PIECE INSERT

Hideo Umezu, 5-39-6 Shonan Takatori, Yokosuka-shi, Kanagawa-ken, Japan

Filed Mar. 28, 1983, Ser. No. 479,455
Claims priority, application Japan, Jul. 12, 1982, 57-119877
Int. Cl.[4] H02B *1/02*
U.S. Cl. 339—126 R 27 Claims



1. A fastener, comprising:

a female member fabricated by means of a molding process;

a male member, insert-molded within said female member and including a head portion and a shank portion, movably disposed, under the influence of a first force, within said female member between a first position at which said female and male members are relatively disposed with respect to each other so as not to achieve a fastening operation, and a second position at which said female and male members are relatively disposed with respect to each other such that a fastening operation is achieved;

frangible means, provided upon said shank portion of said male member and defining a boundary line between a first section of said shank portion of said male member which is disposed interiorly of said female member when said male member is disposed at said second fastening position relative to said female member, and a second section of said shank portion of said male member connected to said head portion of said male member which is disposed exteriorly of said female member when said male member is disposed at said second fastening position relative to said female member, for facilitating the separation of said second section of said shank portion of said male member from said first section of said shank portion of said male member along said boundary line defined by said frangible means under the influence of a second force which is greater than said first force required to move said male member from said first position to said second position within said female member;

male claw means defined upon said male member at a position upstream of said frangible means as viewed in the direction of movement of said male member from said first position to said second position;

female mold indent means defined upon said male member at a position downstream of said frangible means as viewed in the direction of movement of said male member from said first position to said second position; and

male stepped means, defined upon said female member by means of said female mold indent means of said male member as a result of said molding of said female member, for engagement by said male claw means of said male member when said male member is disposed at said second position so as to retain said male member at said second fastened position relative to said female member.

4,566,751

DISTRIBUTOR CAP WITH IGNITION CABLE

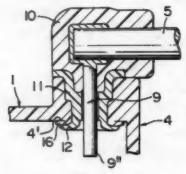
Ryuichi Yoshida; Shigeru Suzuki; Hirotoshi Koishikawa, all of Suzuka; Yoshimi Miyamoto, Toyota, and Kazuhide Kawai, Oobu, all of Japan, assignors to Tokai Electric Wire Company Limited, Japan

Filed Dec. 26, 1984, Ser. No. 685,920

Claims priority, application Japan, Dec. 27, 1983, 58-203320[U]

Int. Cl.[4] H01R *4/24, 13/44*

U.S. Cl. 339—218 S 6 Claims



1. A distributor cap comprising:

an ignition cable having at one end thereof a terminal member;

a bonding member molded from a hot-melt adhesive resin such as to bury a portion of both of said terminal member and said ignition cable therein in the vicinity of said one end;

a connecting member, which is not molded from the same body of material as said bonding member integrally secured to said bonding member, said connecting member receiving a longitudinally intermediate portion of said terminal member such that a distal end portion of said terminal member is exposed to the outside of said connecting member; and

a tower portion, which is not molded from the same bodies of material as said bonding member and said connecting member, formed with a recess which receives said connecting member, and molded from a resin having the same quality as that of the resin employed to form said connecting portion,

said connecting member being fitted into said recess and is integrally welded to said tower portion.

4,566,752

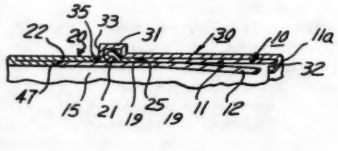
CONTACT ASSEMBLY FOR AN ELECTRICAL CONNECTOR

Valentine J. Hemmer, Sidney, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 499,689, May 31, 1983, abandoned. This application Feb. 15, 1985, Ser. No. 701,909

Int. Cl.[4] H01R *13/11, 4/10*

U.S. Cl. 339—262 R 5 Claims



4. In a three-piece contact assembly of the type having a one-piece inner sleeve including a forward end adapted to receive a pin contact and a rearward end having a diameter sized to receive an electrical conductor, a first outer sleeve mounted to said rearward end, and a second outer sleeve mounted to said forward end, said forward end including a plurality of deflectable tine the ends of which extend radially inward to mate with the pin contact, the improvement wherein said inner sleeve comprises a tubular hood having a rearward portion secured to said inner sleeve and a forward portion consisting of a plurality of hood portions, each said hood portion being spaced from and circumposing said tines.

4,566,753

OPTICAL STAR COUPLER

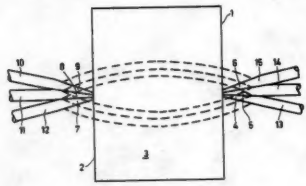
Lothar Mannschke, Eckental, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 515,705, Jul. 20, 1983, abandoned. This application May 22, 1985, Ser. No. 736,976

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229571

Int. Cl.[4] G02B *5/172*

U.S. Cl. 350—96.16 10 Claims



1. A star coupler comprising:

a first group of optical waveguides having tapered portions, each tapered portion terminating in an end face of the waveguide, said tapered portions being arranged adjacent to one another so that the end faces of the waveguides form a first group end face having a periphery;

a second group of optical waveguides having tapered portions, each tapered portion terminating in an end face of the waveguide, said tapered portions being arranged adjacent one another so that the end face of the waveguides form a second group end face having a periphery; and

a graded index rod lens having first and second opposite end faces having peripheries;

characterized in that:

the first group end face is connected to the first end face of the graded index rod lens;

the second group end face is connected to the second end face of the graded index rod lens; and

the entire periphery of the first end face of the graded index rod lens surrounds and is spaced from the entire periphery of the first group end face, and the entire periphery of the second end face of the graded index rod lens surrounds and is spaced from the entire periphery of the second group end face, such that radiation emerging from the tapered portions of the first group of waveguides will be incident on the first end face of the graded index rod lens and will be focused by the graded index rod lens onto the tapered portions of the second group of waveguides.

4,566,754

OPTICAL FIBRES

Keith J. Beales, Ipswich; Clive R. Day, Suffolk; Benjamin J. Ainslie, and James D. Rush, both of Ipswich, all of United Kingdom, assignors to British Telecommunications, London, England

Filed Mar. 23, 1982, Ser. No. 361,093

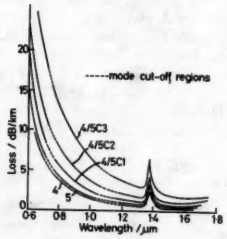
Claims priority, application United Kingdom, Apr. 8, 1981, 8111013

Int. Cl.[4] G02B *5/172*

U.S. Cl. 350—96.30 19 Claims

1. In a method of producing an optical fibre having a core comprised of a silica-based glass having silica and germanium dioxide as the main constituents and a cladding comprised of a silica-based glass having silica as the main constituent, wherein the optical fibre is formed by drawing a preform at an elevated

temperature, wherein the preform comprises a core portion and a cladding portion which correspond to the core and cladding of the formed optical fibre, and wherein the materials and dimensions of the core portion and cladding portion of the preform and the drawing ratio are such that the formed optical



fibre is capable of monomode transmission in the 1.55 μm window and has a wavelength of zero dispersion in the 1.55 μm window, the improvement which comprises drawing the preform at a temperature in the range of from 1900° C. to 2000° C.

4,566,755

COPOLYMERS FOR OPTICAL FIBERS

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Continuation of Ser. No. 522,257, Aug. 11, 1983, abandoned. This application Oct. 4, 1984, Ser. No. 657,479

Claims priority, application Japan, Aug. 24, 1982, 57-147405

Int. Cl.⁴ C08F *214/18*; G02B *5/172*

U.S. Cl. 350—96.34 **1 Claim**

1. In an optical fiber comprising a cladding and a core, the improvement wherein said cladding comprises a copolymer comprising

(a) 100 parts by weight of fluoroalkylmethacrylate, said fluoroalkylmethacrylate giving, when singly polymerized, a homopolymer having the properties of a glass transition temperature and a refractive index satisfying the following formulae (I) and (II), respectively:

$$(1/Tg \leqq 9.47\times10^{-3}-4.556\times10^{-3}\times n^{20} \quad (I)$$

$$n^{20} \leqq 1.42 \quad (II)$$

wherein Tg represents the glass transition temperature and n^{20} represents the refractive index of said homopolymer and

(b) 0.5 to 10 parts by weight of methacrylic acid.

4,566,756

PROJECTION SCREEN

Werner A. L. Heijnemans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,564

Claims priority, application Netherlands, Mar. 7, 1983, 8300817

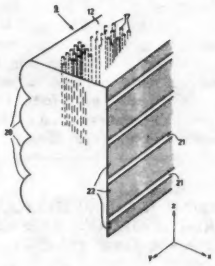
Int. Cl.⁴ G03B *21/60*

U.S. Cl. 350—126 **9 Claims**

1. A projection screen for use in a color television projection system, comprising:

a plate including a substrate formed of a transparent first material, the substrate having a first surface for entry of projected light projected from an image source and also having a second surface for exit of projected light which has traveled through the substrate, the second surface being oriented generally parallel to the first surface, characterized in that

the substrate comprises diffusers for diffusing, in a first direction, projected light, the diffusers including filamentary particles disposed within the first material of the substrate, the filamentary particles being formed of a transparent second material having a refractive index differing from the refractive index of the first material, the longitudinal



axes of the filamentary particles being oriented substantially in a second direction, the second direction being transversely to the first direction, so that projected light entering the first surface, traveling through the substrate and exiting the second surface is diffused in the first direction by means of the diffusers.

4,566,757

HOLOGRAPHIC OPTICAL PROCESSING METHOD AND APPARATUS

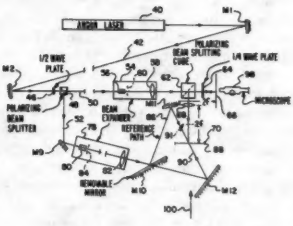
Richard L. Fusek, Dayton; James S. Harris, Centerville, and Kevin G. Harding, Dayton, all of Ohio, assignors to University of Dayton, Dayton, Ohio

PCT No. PCT/US83/00184, § 371 Date Sep. 23, 1983, § 102(e) Date Oct. 12, 1983, PCT Pub. No. WO83/02831, PCT Pub. Date Aug. 18, 1983

Continuation-in-part of Ser. No. 348,461, Feb. 12, 1982, Pat. No. 4,478,481. This PCT application Feb. 14, 1983, Ser. No. 548,892

Int. Cl.⁴ G03H *1/16*

U.S. Cl. 350—162.12 **21 Claims**



1. A method of performing optical processing on optical information corresponding to a subject disposed within a subject plane, comprising the steps of:

directing a first coherent beam of light at the subject such that said light is diffracted, reflected and/or transmitted thereby, whereafter said beam contains optical information regarding the subject;

focusing said beam containing said subject information so as to define a Fourier transform plane and to image said information within an image plane beyond said transform plane;

disposing means for recording a hologram thereon at or near said image plane so as to receive thereon said beam containing said subject information;

directing a second coherent beam of light onto said recording means from a first direction so as to form an interference pattern with said first beam containing said subject information;

recording a hologram of said subject information on said recording means;

directing said second beam to said recording means from a direction conjugate to said first direction for diffraction thereby to the subject plane in a direction exactly opposite to that travelled by said first beam containing said subject information, whereby said Fourier transform is redefined at said transform plane and said subject information is carried within said second beam to the subject plane; and

manipulating said subject information contained within one of said beams at said transform plane.

4,566,758

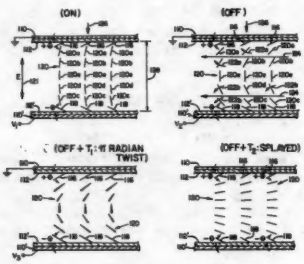
RAPID STARTING, HIGH-SPEED LIQUID CRYSTAL VARIABLE OPTICAL RETARDER

Philip J. Bos, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 9, 1983, Ser. No. 493,107

Int. Cl.⁴ G02F *1/13, 1/137*

U.S. Cl. 350—346 **5 Claims**



1. A rapid starting, high-speed liquid crystal variable optical retarder comprising:

a liquid crystal cell which includes a pair of generally parallel electrode structures that contain a mixture of a chiral agent and a nematic liquid crystal material which has directors, the inner surface of each electrode structure including a director alignment layer which has been conditioned so that the directors of the liquid crystal material in contact therewith become substantially uniformly aligned to form tilt bias angles with the conditioned surface, the tilt bias angles of the directors in contact with the conditioned surface of one electrode structure being defined in a rotational sense opposite to the tilt bias angles of the directors in contact with the other conditioned surface of the other electrode structure and the projections of the directors in contact with the conditioned surfaces being aligned so that the projections onto one of the conditioned surfaces are parallel to the projections onto the other conditioned surface; and

the liquid crystal cell being operable in response to an applied electric field to cause a substantial number of the surface noncontacting directors to align in substantially end-to-end relation in a direction generally normal to the conditioned surfaces to provide a first amount of optical retardation through the cell of light incident to one of the surfaces of the electrode structures, in rapid response to a substantial diminution of the magnitude of the electric field to cause at least some of the surface noncontacting directors within the interior of the cell to rotate about axes that are perpendicular to the normal to the conditioned surfaces to provide a second amount of optical retardation of light incident to one of the surfaces of the electrode structures, and in response to a relatively prolonged absence of the electric field to inhibit director relaxation to a splayed state.

4,566,759

LATERALLY FLUORINATED LIQUID CRYSTAL MATERIALS AND FREQUENCY CHANGE DEVICES

Damien G. McDonnell, and Robert A. Smith, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 309,511, Oct. 7, 1981, abandoned. This application Apr. 24, 1984, Ser. No. 603,979

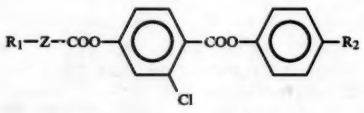
Claims priority, application United Kingdom, Oct. 13, 1980, 8032944

Int. Cl.⁴ C09K *19/20, 19/30, 19/32;* G02F *1/13*

U.S. Cl. 350—346 **13 Claims**

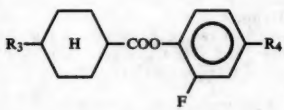
1. A liquid crystal composition suitable for use as a two-frequency material in a two-frequency switching device, the composition comprising a mixture of:

i. a first component A having a positive dielectric anisotropy and consisting of one or more compounds having a general formula:



wherein R_1 and R_2 are independently n-alkyl groups having from 3 to 7 carbon atoms; and Z is selected from 1,4-phenylene, trans-1,4-cyclohexyl, and 2,6-naphthyl; and

ii. a second component B having a low viscosity and consisting of one or more compounds having a general formula:



wherein R_3 and R_4 are independently n-alkyl groups having from 3 to 7 carbon atoms.

4,566,760

MULTI-PRODUCT ACOUSTO-OPTIC TIME INTEGRATING CORRELATOR

Irwin J. Abramovitz; Norman J. Berg, both of Baltimore, Md., and Michael W. Casseday, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1984, Ser. No. 599,365

Int. Cl.⁴ G02F *1/33;* G06G *9/00*

U.S. Cl. 350—358 **17 Claims**

1. A device for processing signals to obtain a multi-product, time integrated, correlated output signal, comprising:

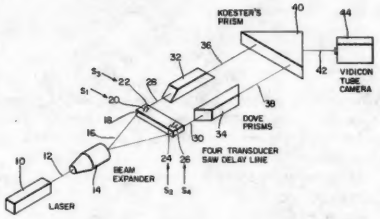
(a) means for producing a laser light beam;

(b) means for expanding said laser light beam into a first sheet beam;

(c) an acousto-optic medium having an axis and a planar surface extending between opposite first and second ends which is disposed in the path of said sheet beam such that the sheet beam traverses the medium between the medium ends along and parallel to the medium;

(d) a first acoustic transducer, disposed at the first end of the acousto-optic medium;

(e) a second acoustic transducer, disposed at the second end of the acousto-optic medium;
(f) a third acoustic transducer, disposed at the first end of the acousto-optic medium;
(g) a fourth acoustic transducer, disposed at the second end of the acousto-optic medium;
(h) a first signal, supplied to said first acoustic transducer, for propagating said first signal on the surface of said acousto-optic medium in the direction of the second end of the acousto-optic medium;
(i) a second signal, supplied to said second acoustic transducer, for propagating said second signal on the surface of said acousto-optic medium in the direction of the first end of the acousto-optic medium;
(j) a third signal, supplied to said third acoustic transducer, for propagating said third signal on the surface of said acousto-optic medium in the direction of the first end of the acousto-optic medium;



(k) a fourth signal, supplied to said fourth acoustic transducer, for propagating said fourth signal on the surface of said acousto-optic medium in the direction of the first end of the acousto-optic medium;
(l) wherein said first and second signals diffract said sheet beam to produce a first, product diffracted beam of light, said first product diffracted beam containing the product of said first signal with said second signal;
(m) wherein said third and fourth signals diffract said sheet beam to produce a second, product diffracted beam of light, said second product diffracted beam containing the product of said third signal with said second signal;
(n) means for rotating said first product diffracted beam and said second product diffracted beam so that they are orthogonal to each other;
(o) means to combine said orthogonal, product diffracted beams; and
(p) time integrating photodetecting means disposed in the path of the combined beam for generating a multi-product, time integrated, correlated output signal.

4,566,761

BIREFRINGENT OPTICAL WAVELENGTH MULTIPLEXER/DEMULTIPLEXER

W. John Carlsen, Boston, and Paul Melman, Newton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 13, 1984, Ser. No. 650,012
Int. Cl.[4] G02B *5/30*; H04J *1/08*
U.S. Cl. 350—401 **8 Claims**

1. A birefringent optical wavelength multiplexer/demultiplexer comprising

first polarization beam splitting means for splitting an applied collimated beam of light into two linearly polarized beams whose directions of propagation are perpendicular to one another;

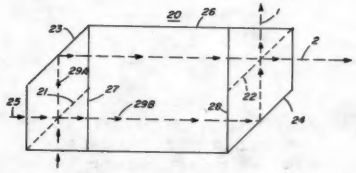
first reflecting means for reflecting one of said linearly polarized beams parallel to the other polarized beam;

a birefringent element having a pair of opposed parallel surfaces, with an optical axis oriented nominally parallel to said surfaces, said element being oriented with said parallel surfaces perpendicular to the direction of propagation of said linearly polarized beams, said optical axis being oriented half way between the two polarized beams incident upon said element, 45° from the polarization axis of each said beam, wherein

one electric field component of each of said polarized beams which is parallel to an "extraordinary" axis of said element propagates at a different rate of speed, dependent upon the material of said element, than the other electric field component which is parallel to an "ordinary" axis of said element;

second reflecting means for reflecting the other of said linearly polarized beams, following propagation of said other beam through said element, in a direction perpendicular to that of said one of said polarized beams following propagation of said one polarized beam through said element; and

second polarization beam splitting means oriented to receive both said reflected other beam and the propagated one beam, wherein



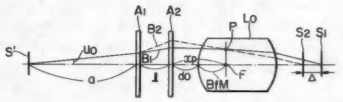
(1) when the propagated other beam and the propagated one beam have polarization states which are linearly polarized parallel to said respective applied polarized beams, said reflected other beam is transmitted by said second polarization beam splitting means, and said propagated one beam is reflected by said second polarization beam splitting means, whereby said reflected other beam and said propagated one beam are combined and transmitted outwardly from a first port; and
(2) when the propagated other beam and the propagated one beam have polarization states which are linearly polarized perpendicular to said respective applied polarized beams, said reflected other beam is reflected by said second polarization beam splitting means, and said propagated one beam is transmitted by said second polarization beam splitting means, whereby said reflected other beam and said propagated one beam are combined and transmitted outwardly from a second port.

4,566,762

DUAL FOCUS OPTICAL SYSTEM

Kinya Kato, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,388
Claims priority, application Japan, Sep. 2, 1982, 57-153070
Int. Cl.[4] G02B *5/30, 27/28*
U.S. Cl. 350—411 **12 Claims**



7. A dual focus optical system for causing the images of first and second objects separate from each other on the optical axis to be formed on the same image plane at the same magnification, comprising:

an objective lens having an image side focal Plane for converging a first light ray and a second light ray, said first light ray forming an image of said first object and said second light ray forming an image of said second object;

a diverging element provided between said image plane and said objective lens for causing the second light ray to diverge relative to the first light ray; and

a converging element provided between said diverging element and said objective lens for causing the second light ray to converge relative to the first light ray, said converging element being spaced apart from said diverging element;

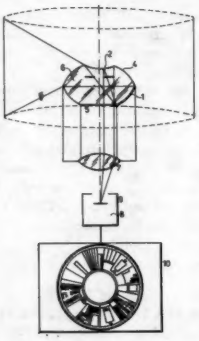
the optical characteristics and positions of said diverging element and said converging element causing said second light to intersect with said first light ray at the object side of said converging element at a position of intersection that is coincident with said image side focal plane of said objective lens.

4,566,763

PANORAMIC IMAGING BLOCK FOR THREE-DIMENSIONAL SPACE

Pál Greguss, Budapest, Hungary, assignor to Budapesti Muszaki Egyetem, Budapest, Hungary

Filed Jan. 30, 1984, Ser. No. 574,902
Claims priority, application Hungary, Feb. 8, 1983, 434/83
Int. Cl.[4] G02B *13/06, 17/00*
U.S. Cl. 350—441 5 Claims



1. Panoramic imaging block for three-dimensional space based on flat cylindrical perspective, having reflective and refractive surfaces to be described with a mathematical function, said imaging block comprising at least four surfaces for influencing the propagation of waves, said surfaces are formed as reflective surfaces and refractive surfaces of equal number for producing an annular image from the approximately cylinder-symmetrical space-part around the concentric-symmerical axis of the imaging block, wherein said reflective surfaces are aspherical surfaces which can be described with the mathematical function $x=y^2/4f$, wherein:

x=the distance measured from predetermined base points of the reflective surfaces;

y=the distance of predetermined sursfacial points measured from the concentric axis of symmetry;

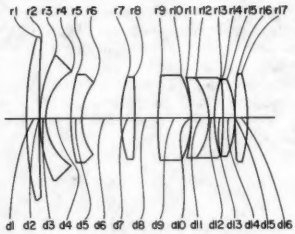
f=the focal distance of the aspheric reflective surfaces.

4,566,764

WIDE-ANGLE LENS

Hirohumi Matsuo, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,458
Claims priority, application Japan, Apr. 6, 1983, 58-60617
Int. Cl.[4] G02B *9/64*
U.S. Cl. 350—459 6 Claims



1. A retro-focus type wide-angle lens comprising nine component lenses which are numbered consecutively from one to nine when viewed from the object side and which satisfy the conditions below,

the first lens being a positive meniscus whose convex surface faces the object side,

the second and third lenses being negative menisci whose convex surfaces face the object side,

the fourth lens being a positive lens whose surface of a smaller radius of curvature faces the object side,

one of the fifth and sixth lenses being a double-convex lens whose surface of a smaller radius of curvature faces the image side, the other being a positive meniscus whose surface of a smaller radius of curvature faces the image side,

the seventh lens being a double-concave lens, the sixth and seventh lenses being cemented together,

the eighth lens being a positive meniscus whose surface of a smaller radius of curvature faces the image side,

the ninth lens being a double-convex lens whose surface of a smaller radius of curvature faces the image side,

whereby the wide-angle lens comprises eight sets of elements and satisfies the following conditions,

(1) $1.0f<|f_{1,2,3}|<1.3f$, $f_{1,2,3}<0$

(2) $1.1f<r_6/(n_3-1)<1.5f$

(3) $0.4f<d_6+d_7<0.7f$

(4) $(n_4+n_5)/2>1.65$

(5) $n_6<n_7$

(6) $0.6f<|r_{12}|<0.9f$, $r_{12}<0$

where f is the focal length of the whole system, $f_{1,2,3}$ is the composite focal length from the first lens to the third lens, n_i is the refractive index of the i-th lens with respect to d lines, r_i is the radius of curvature of the i-th surface, and d_i is the distance between the i-th surface and the (i+1)-th surface.

4,566,765

APPARATUS FOR SUMMING SEVERAL RING-SHAPE LASER BEAMS

Tateoki Miyauchi; Mikio Hongo; Katsuro Mizukoshi, all of Yokohama; Hiroshi Yamaguchi, Fujisawa, and Akira Shimase, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,439
Claims priority, application Japan, Oct. 15, 1982, 57-179821
Int. Cl.[4] G02B *5/08, 27/14;* B23K *9/00;* G01B *11/26*
U.S. Cl. 350—619 15 Claims

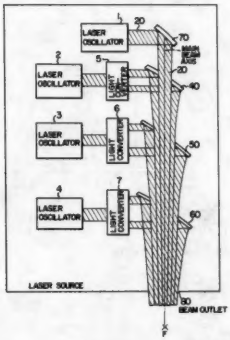
1. A laser source apparatus comprising:

n-laser oscillators of a predetermined type ($n \geqq 2$, an integer)

for generating laser beams to be aligned along a main beam axis;

(n−1) light converters coupled with (n−1) ones of said laser oscillators, each converting a laser beam generated from the corresponding laser oscillator into a substantially ring-shaped laser beam;

(n−1) reflecting mirrors disposed on the main beam axis at an angle and adapted to receive the ring-shaped laser beams from said (n−1) light converters, respectively,



each of said reflecting mirrors having a through-hole of dimensions of enough to transmit an entering laser beam;

a non-ring-shaped laser beam emitted from one laser oscillator other than said (n−1) laser oscillators being transmitted to travel on the center of said main beam axis,

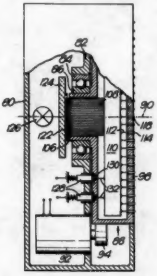
whereby the laser beams reflected by said reflecting mirrors and the non-ring-shaped beam emitted from said one laser oscillator are arranged coaxially of the main beam axis to produce a combined laser beam of on output power of the sum of said laser beams at an output end of the apparatus.

4,566,766

IMAGE TRANSMISSION DEVICES

Yehoshua Gur, Jerusalem, Israel, assignor to Gur Optics and Systems, Ltd., Jerusalem, Israel

Filed Apr. 29, 1983, Ser. No. 489,903
Claims priority, application Israel, Mar. 18, 1983, 68176
Int. Cl.⁴ G03B *21/28*
U.S. Cl. 353—122 **26 Claims**



1. A compact image transmission and modification device in which an object is mountable in the optical path between a light source and a first surface on which the light from said source, modulated by the different optical densities of said object, is capable of constituting a first image thereof, and on which first surface said first image is transformed into electrical signals which are transmitted to a second surface where said electrical signals are transformed into light signals capable of constituting a second, modified, image of said object, said device further comprising:

a base element incorporating said first surface and said second surface, and defining on said first surface at least one first array of locations having a first interlocation spacing, and on said second surface at least one second array of locations corresponding to said first array of locations and having a second interlocation spacing;

photodetector means at said locations of said first array for producing said electrical signals;

electrical-to-light signal-transforming means at said locations of said second array for producing said light signals;

a plurality of electrical-signal transmission means, each of said means electrically coupling a location of said first array with a corresponding location of said second array; and

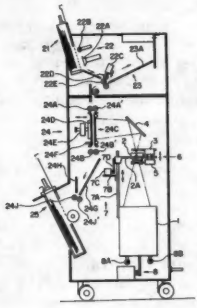
means for imparting to said base element a continuous rotary movement about a rotation axis defined therein, to cause said first array to scan said first image, wherein the image modification produced by said device is substantially a function of the ratio between said first interlocation spacing and said second interlocation spacing.

4,566,767

MULTIPLE IMAGE TYPE PHOTOGRAPHING APPARATUS

Masahide Akisada; Norio Ookawa, and Yuji Takamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 2, 1984, Ser. No. 596,171
Claims priority, application Japan, Apr. 1, 1983, 58-57048
Int. Cl.⁴ G03B *29/00*
U.S. Cl. 354—76 **7 Claims**



1. A multiple image photographing apparatus comprising:

a picture displaying device for displaying an image to be photographed;

a projecting optical system for forming the image of a picture displayed on said picture displaying device on a film sheet; and

a film conveying mechanism for conveying film sheets from storing means to a photographing position;

a mirror arranged on an optical axis of said projecting optical system and a magnification changing auxiliary lens selectively movable into alignment with said optical axis;

means for moving said picture displaying device in a horizontal direction through a distance determined in accordance with a selected photographing magnification;

means for moving said film conveying mechanism to move said film at said photographing position in a vertical direction through a distance determined in accordance with said selected photographing magnification;

means for selectively positioning said lens in alignment with or away from said optical axis in accordance with said

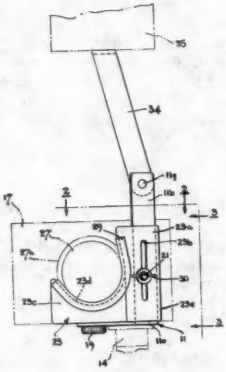
selected photographing magnification, and means for masking said film sheet at said photographing position with a mask size determined in accordance with said selected photographing magnification.

4,566,768

MOUNT FOR SUPPORTING CAMERA HAVING ELONGATED LENS

Charles L. Bosdet, 310 S. Prospect, #6, Redondo Beach, Calif. 90277

Filed Oct. 24, 1983, Ser. No. 544,737
Int. Cl.[4] G03B *17/12, 17/56*
U.S. Cl. 354—81 **8 Claims**



1. A camera mount for supporting a camera having an elongated barrel-shaped lens on a stand comprising

an L-shaped bracket having first and second arms substantially at right angles to each other,

means for removably attaching said first arm to said stand,

means for removably and adjustably attaching the body of the camera to said first arm at a selected position therealong,

a lens support bracket member having first and second portions, said second portion having an arcuate cutout formed therein,

means for removably and adjustably attaching said lens support bracket to said second arm at a selected position along the first portion thereof,

resilient liner means along the edge of said arcuate cutout,

the barrel of said lens being aligned with said arcuate cut out and the end portion of said barrel and being seated in said arcuate cutout against said liner means.

4,566,769

POWER SUPPLY UNIT FOR ELECTRONIC FLASH

Akira Inoue, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,027
Claims priority, application Japan, Dec. 29, 1982, 57-229859; Feb. 15, 1983, 58-023626
Int. Cl.[4] G03B *1/18, 15/05*
U.S. Cl. 354—145.1 **2 Claims**

1. A power supply unit for electronic flash, comprising:

a converter for converting an output from a low voltage output source to a high d.c. voltage;

a main discharge capacitor adapted to be charged by an the d.c. output from the converter;

means for detecting when the main discharge capacitor has been charged to a given voltage;

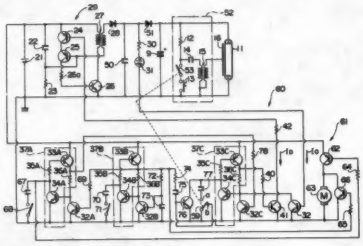
a manual main switch for starting the converter;

a converter driving latch circuit activated by an operation of the main switch to deliver a drive signal to the converter so that the converter may charge the main discharge capacitor and deactivated by a signal from the detecting means to cease to drive the converter

a film winding initiate switch which is mechanically interlocked with a completion of a shutter operation;

a winding latch circuit activated by an operation of the film winding initiate switch to deactivate the converter driving latch circuit and to deliver a drive signal to a film winding motor;

a winding complete switch which is mechanically interlocked with a completion of a film winding operation;



a brake latch circuit activated by an operation of the winding complete switch to deactivate the winding latch circuit and to deliver a brake signal to the film winding motor;

means for supplying a start signal to the converter driving latch circuit which activates the latter circuit when initiating the operation of the brake latch circuit; and

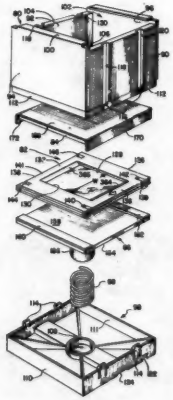
means for deactivating the brake latch circuit at a given time interval after the initiation of operation of the brake latch circuit.

4,566,770

MOUNT FOR TRANSPARENCY FILM FRAME

Frank M. Czumak, Salem, N.H., and Joseph H. Wright, Andover, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 28, 1984, Ser. No. 675,651
Int. Cl.[4] G03B *17/26;* G03D *5/06*
U.S. Cl. 354—276 **10 Claims**



1. A mount for supporting a section of unexposed self-developing type photographic film, said mount comprising:

a substantially rigid member having a leading end, a trailing end, and front and rear surfaces;

first means defining an exposure aperture in said member, said first means including first and second surfaces which are parallel with said leading and trailing ends, respectively, said first and second surfaces being inclined outwardly from each other as each of said surfaces extends from said rear surface to said front surface;

second means defining a recessed area in said rear surface, said recessed area including a first area for supporting a section of self-developing type photographic film in alignment with said exposure aperture, and a second area which extends around the periphery of said first area, said first area being located closer to said rear surface than is said second area so as to define a means for receiving liquid which may be expressed outwardly from the edges of the section of film during its processing; and

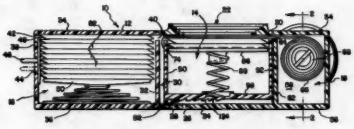
means formed in said leading end of said member for engaging and deflecting a support of a roller, having a length substantially equal to the width of said exposure aperture, so as to cause the roller to move initiaily into engagement with said member at said front surface at a location before or at said first surface as said member is moved leading edge first during processing of the film in a processor.

4,566,771

PHOTOGRAPHIC FILM ASSEMBLAGE

Joseph H. Wright, No. Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 28, 1984, Ser. No. 675,857
Int. Cl.⁴ G03B *17/26*
U.S. Cl. 354—283 **8 Claims**



1. A photographic film assemblage comprising:

a stack of individual elements including a plurality of film units and a dark slide for protecting the uppermost film unit from premature exposure to ambient light; and

a housing for enclosing said stack, said housing including an exposure aperture through which image bearing light is adapted to travel during exposure of a film unit, an egress through which said elements are adapted to be sequentially moved to the exterior of said housing, and an ingress through which a film advancing member is adapted to pass during loading of said film assemblage into an exposure chamber so as to engage and progressively move said dark slide through said egress while simultaneously progressively uncovering said uppermost film unit; and

means on said housing adapted to cooperate with a member in the exposure chamber for preventing premature withdrawal of said film assemblage from the exposure chamber during its loading.

4,566,772

FILM PROCESSOR FOR PREMOUNTED TRANSPARENCY FRAMES

Donald J. Sulesky, Arlington, and Joseph H. Wright, No. Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 28, 1984, Ser. No. 675,856
Int. Cl.⁴ G03D *5/06*
U.S. Cl. 354—303 **11 Claims**

1. Apparatus for processing exposed premounted transparency frames so as to produce visible images within the frames, said apparatus comprising:

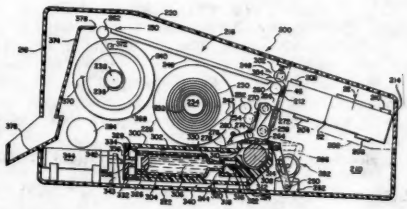
means for defining a support for receiving a container having therein at least one exposed premounted transparency frame;

first means including a supply reel containing a length of flexible sheet material;

second means including a take-up reel upon which said flexible sheet material is adapted to be wound after its use in processing exposed premounted transparency frames;

a processing liquid applicator for applying a coating of processing liquid to a section of said flexible sheet material;

a laminating station to which an exposed premounted transparency frame is adapted to be moved from the container and into engagement with said coated section;



a stripping station at which said coated section is removed from the exposed premounted transparency frame;

means for driving said take-up reel in a first direction so as to move said coated section of said flexible sheet material from said processing liquid applicator, into engagement with the exposed premounted transparency frame at said laminating station, and then toward said stripping station and said take-up reel; and

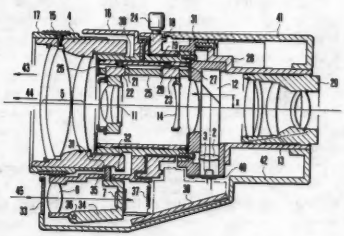
said second means being adapted to be driven in a second direction for stripping said coated section of said sheet material from the exposed premounted transparency frame after a period of time sufficient to initiate the formation of a visible image within the premounted transparency frame while simultaneously directing the latter toward a station at which it may be retrieved.

4,566,773

FOCUS DETECTING DEVICE

Naoya Kaneda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,686
Claims priority, application Japan, Jun. 24, 1983, 58-96702[U]
Int. Cl.⁴ G03B *3/00*
U.S. Cl. 354—403 **4 Claims**



1. A lens mounting comprising:

(a) a taking lens including a focusing lens and a lens holder for said taking lens;

(b) light emitting means having a light emitting element housed within said lens holder and a reflection mirror for reflecting the light beam projected from said light emitting element toward an object to be photographed, wherein said reflection mirror is placed at a position opposing said light emitting element, sandwiching the optical axis of said focusing lens therebetween, and the optical axis of projected light beam, after being reflected, is offset from the optical axis of the focusing lens; and

(c) means for receiving a reflected light beam which has also been reflected by the object, said light receiving means being placed at a position at the outside of an effective diameter of said taking lens and at a side of the optical axis of said taking lens at which said light emitting element is placed.

4,566,774

AUTOMATIC EXPOSURE CAMERA

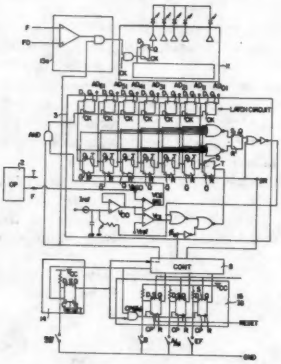
Kazuo Shiozawa, and Kijiro Suzuki, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 484,296, Apr. 15, 1983, abandoned, which is a continuation of Ser. No. 267,389, May 26, 1981, abandoned. This application May 17, 1984, Ser. No. 611,377

Claims priority, application Japan, May 27, 1980, 55-70603

Int. Cl.[4] G03B *17/18*

U.S. Cl. 354—413 2 Claims



1. In an automatic exposure camera which includes a lens having an open aperture value associated therewith, means for detecting the brightness of light reflected from a subject to be photographed and for generating an optimum aperture value for the photographing operation in accordance therewith, a circuit for controlling the photographing operation in accordance with the optimum aperture value generated by said means and having a plurality of inputs thereto, and an AE locking circuit actuatable prior to a photographing operation to cause said circuit to control a subsequent photographing operation in accordance with the optimum aperture value generated by said means on actuation of said AE locking circuit by causing said control circuit to be blocked against responding to changes in the plural inputs thereto subsequent to actuation of said AE locking circuit and until completion of a subsequent photographi ɜ operation, the improvement comprising:

warning means for comparing at least the optimum aperture value and the open aperture value and for outputting a warning signal in accordance with said comparison when the detected light reflected from the subject is either too low or too bright for automatic exposure photography,

said AE locking circuit being connected to said warning means to inhibit the outputting of said warning signal when the AE locking circuit is actuated so as to thereby prevent presentation of a false light level warning during use of the AE locking circuit.

2. In an automatic exposure camera in accordance with claim 1, said plural inputs to the control circuit including inputs indicative of user-specified operating modes, said user-operating modes including a self-timing shutter release feature, a flash exposure feature, and switching between automatic and manual operating modes, whereby the control circuit is rendered unreponsive to changes in said user-specified operating modes on actuation of the AE locking circuit.

4,566,775

EXPOSURE CONTROL APPARATUS BASED ON A MULTIMETERING SYSTEM

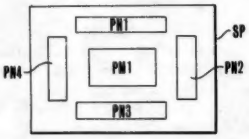
Tokuichi Tsunekawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

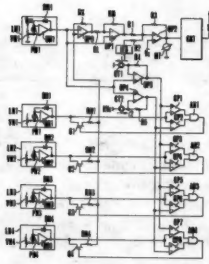
Continuation of Ser. No. 513,153, Jul. 13, 1983. This application May 21, 1985, Ser. No. 736,540

Claims priority, application Japan, Jul. 16, 1982, 57-124183; Jul. 16, 1982, 57-124184; Jul. 22, 1982, 57-127953

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—432 2 Claims





1. A light metering system for a camera including:

(a) first light metering means for measuring the central portion of an object, said means generating an electrical signal corresponding to the brightness of the central portion of the object;

(b) a plurality of second light metering means for metering brightness of the surrounding portion of the object, each of said second light metering means generating an electrical signal corresponding to the brightness of the surrounding portion of the object;

(c) computing means for computing an output of said first light metering means and outputs of said second light metering means;

(d) exposure control means for controlling the amount of exposure in accordance with an output of said computing means;

(e) comparison means for comparing the outputs of the first light metering means with those of the second light metering means; and

(f) prevention means for preventing the output of each of said second light metering means from being added to said computing means, said prevention means preventing the

operation of one or more of said second light metering means whose output is greater than a predetermined difference from the output of the first light metering means on the basis of the signal from the comparison means.

4,566,776

MAGNETIC TONER DEVELOPING DEVICE

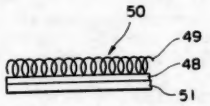
Shiroh Kondoh, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 31, 1983, Ser. No. 481,068

Claims priority, application Japan, Mar. 31, 1982, 57-50978; Mar. 31, 1982, 57-50979

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 355—3 DD **16 Claims**



1. A device for developing an electrophotographic latent image formed on an imaging surface using electrically insulating and magnetically attractable toner particles, comprising:

carrier means for carrying thereon said toner particles, said carrier means being driven to move along a predetermined path which passes through a developing region where said latent image is developed by said toner particles carried on said carrier means;

means for producing a magnetic field causing said toner particles to be attracted to said carrier means; and

film forming means for forming a film of said toner particles on said carrier means before said carrier means enters into said developing region, said film forming means including a doctor blade which is resiliently pressed against said carrier means and said doctor blade being provided at its forward end with an edge portion having an inclined face opposite to said carrier means thereby forming a wedge shaped entrance section having an angle in the range of $15° \pm 15°$ between said inclined end face and said carrier means convergent in the direction of movement of said carrier means.

4,566,777

PROCESS KIT FOR IMAGE FORMING APPARATUS

Haruhisa Honda; Shigeyoshi Onoda, both of Yokohama, and Fumio Nishino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1983, Ser. No. 523,365

Claims priority, application Japan, Aug. 23, 1982, 57-145803; Aug. 23, 1982, 57-145804

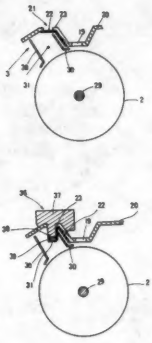
Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—3 R **16 Claims**

1. A process kit detachably mountable into an image forming apparatus, comprising:

process means for image formation, said process means including corona discharging means or the like having a first opening opposed to a surface to be subjected to the corona discharging operation;

a casing for containing said process means as a unit, said casing being provided with means defining a casing opening along said corona discharging means at a position different from that of said first opening of said corona discharging means, wherein said means defining said casing opening is for allowing a cleaning device access to said corona discharging means and for allowing the cleaning device to move along said corona discharging means to effect a cleaning of said corona discharging means; and



a cover movable between a first position for covering said casing opening and a second position wherein said cover is retracted from said first position.

4,566,778

PRESSURE FIXING DEVICE

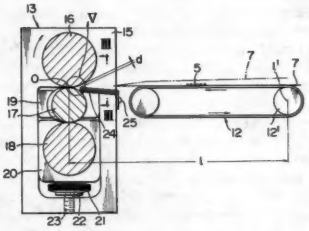
Yoshitaka Sasaki, Kumagaya, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Apr. 15, 1983, Ser. No. 485,510

Claims priority, application Japan, Apr. 20, 1982, 57-66128; Aug. 4, 1982, 57-135903

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 355—3 FU **8 Claims**



1. In a pressure fixing device having

at least a pair of fixing rolls each having peripheral velocity V_1 and maintained in a pressing engagement with each other such that their axes cross each other at a small angle θ_1 to allow a supporter supporting a toner image thereon to move in a direction therebetween at a velocity V_2, one of the fixing rolls contacting and fixing the toner image on the supporter during movement of the supporter between the rolls; and

a guide member located anterior to the fixing rolls with respect to the direction of movement of the supporter and having a forward end located in spaced juxtaposed relation to peripheral surfaces of the fixing rolls;

wherein the improvement comprises that:

the peripheral velocity V_1 of the fixing rolls is set such that $V_2 \geqq V_1$ and the ratio V_1/V_2 is above about 0.95;

A guide member is arranged such that a gap between the forward end of the guide member and the surface of that one of the fixing rolls disposed to contact the toner image is of a dimension about 5–20 times greater than the thickness of the supporter before fixing of the toner image is

effected, said gap dimension occurring at least at a central portion of the length of the fixing rolls; and

a line of contact between the fixing rolls is inclined at a small angle θ' with respect to a straight line perpendicular to the direction of movement of the supporter.

4,566,779

REPRODUCING MACHINE HAVING A REMOVABLE PROCESS UNIT

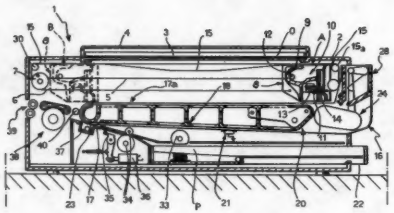
Giuseppe Coli, Pavone, and Luciano Rattin, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Feb. 6, 1984, Ser. No. 577,357

Claims priority, application Italy, Feb. 10, 1983, 67147 A/83

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **3 Claims**



1. A reproduction machine to reproduce an original on a substrate, comprising:

a structural housing,

means in said housing for supporting said original, a scanning device for optically scanning said original, a process unit including a photoconductive member, a toner supply means and a developing device, said process unit being conditioned by said scanning device for forming a latent image of said original on said photoconductive member,

said developing device carrying the toner supplied by said supplying means to develop said latent image, wherein the improvement includes a cartridge for supporting said process unit including a support structure for supporting said photoconductive member in a closed loop arrangement therearound, having a substantially flattened form and upper and lower faces rigidly connected to and parallel to each other and to said original, said photoconductive member forming over said upper face a planar surface on which said latent image is formed,

said structure also comprising drive means for advancing said member at one end of said flattened structure and a resilient channel-shaped portion integral with the structure and placed opposite with respect to said driving means to tension said member around said structure and means for removably mounting said cartridge in said housing together with said process unit so that it can be replaced when said supply means has exhausted the toner.

4,566,780

SHELL-TYPE ELECTROSTATIC COPYING APPARATUS

Hiroshi Kajita, Kobe, and Tadanobu Nakajima, Sakurai, both of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Feb. 7, 1984, Ser. No. 577,916

Claims priority, application Japan, Feb. 21, 1983, 58-26283

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**

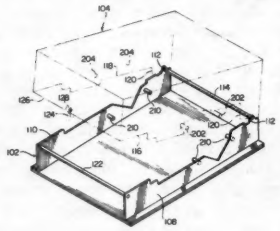
1. A shell-type electrostatic copying apparatus comprising a lower supporting frame, an upper supporting frame mounted for free pivotal movement about a pivot axis extending in the front-rear direction of said apparatus between an open position and a closed position, said upper supporting frame having a vertical front base plate and a vertical rear base plate spaced from each other in said front-rear direction, and a unit detachably mounted on the upper supporting frame, said unit including a unit frame having a front wall and a rear wall spaced from each other in said front-rear direction and a rotating drum rotatably mounted on the unit frame;

a provisional unit placing means provided on the lower supporting frame for supporting the unit frame of said unit for free movement over a predetermined range in said front-rear direction;

one of the front wall of the unit frame and the vertical front base plate of the upper supporting frame having formed therein at least two laterally spaced engaging openings, and the other of the front wall of the unit frame and the vertical front base plate of the upper supporting frame having formed therein at least two laterally spaced engaging projections, and one of the rear wall of the unit frame and the vertical rear base plate of the upper supporting frame having formed therein at least two laterally spaced engaging projections and the other of the rear wall of the unit frame and the vertical rear base plate of the upper supporting frame having formed therein at least two laterally spaced engaging openings, and

a restraining means for releasably restraining the movement of the unit frame in said front-rear direction with respect to the upper supporting frame,

when the unit frame is placed at a first predetermined position on the provisional unit placing means and the upper supporting frame is pivoted from the open position to the closed position, the engaging openings formed in said one of the front wall of the unit frame and the vertical front



base plate of the upper supporting frame are brought into alignment in said front-rear direction with the engaging projections formed in said other of the front wall of the unit frame and the vertical front base plate of the upper supporting frame and the engaging projections formed in said one of the rear wall of the unit frame and the vertical rear base plate of the upper supporting frame are brought into alignment in said front-rear direction with the engaging openings formed in said other of the rear wall of the unit frame and the vertical rear base plate of the upper supporting frame,

when the unit frame is moved rearwardly or frontwardly from said first predetermined position to a mounting position, the engaging openings formed in said one of the front wall of the unit frame and the vertical front base plate of the upper supporting frame are engaged with the engaging projections formed in said other on the front wall of the unit frame and the vertical front base plate of the upper supporting frame and the engaging projections formed in said one of the rear wall of the unit frame and the vertical rear base plate of the upper supporting frame are engaged with the engaging openings formed in said other of the rear wall of the unit frame and the vertical rear base plate of the upper supporting frame,

when thereafter the movement of the unit frame in said front-rear direction with respect to the upper supporting frame is releasably restrained by the restraining means, the unit is detachably mounted on the upper supporting frame.

4,565,781

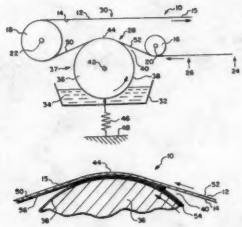
METHOD OF APPARATUS FOR LIQUID DEVELOPING OF ELECTROSTATIC IMAGES IN AN ELECTROPHOTOGRAPHIC IMAGING SYSTEM INCLUDING A LOOPED IMAGE CARRIER

Manfred R. Kuehnle, New Loudon, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 328,809, Dec. 9, 1981, Pat. No. 4,410,260. This application Jul. 1, 1983, Ser. No. 510,281

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—10 8 Claims



1. A method of toning the latent image formed on the exterior of a looped electrophotographic belt having a photoconductive layer on its exterior surface, said belt extending between and looped around a plurality of rollers supporting the same including two spaced apart rollers, the belt moving in a reach between the two spaced apart rollers which would define a flat tangential plane if passed directly between the two rollers without being disturbed, in which the latent image is formed on the belt and appears on the exterior surface of said reach and is adapted to pass along said reach toward one of the two spaced apart support rollers, there being a toning station adjacent said reach and located between the two spaced apart support rollers, the latent image being required to pass through said toning station before passing around said one support roller, said method comprising:

A. providing a sump at said toning station, said sump containing a body of liquid toner material and a resiliently biased toning roller having its axis parallel with the axes of said support rollers, one portion of said toning roller being engaged in said body of liquid toner material,

B. spreading the spaced apart rollers and also pressing the toning roller while still in said body of liquid toner material toward said reach to such an extent that a second portion of said toning roller circumferentially spaced from said one portion intrudes past said plane inwardly of the loop and engages said belt to establish an inward bow offset from said plane defining a nip and a free section of the belt providing reach portions of said belt extending between said second portion of said toning roller and each of said support rollers, the reach portions being under tension and free of said rollers, a substantial area of said reach being so engaged with an arcuate segment of said second portion of said toning roller at a wrap angle between 15° and 110° relative to the arcuate segment,

C. driving one of said plurality of rollers to cause movement of said belt to bring the latent image into said toning station and

D. rotating the toning roller at a speed which provides a circumferential movement when engaged with the belt that is at least equal to the movement of the belt, such toning roller acting to pick up onto said one portion of its surface toner material from said body bringing it into the nip between the toning roller and the belt as the belt engages said second portion of said toning roller defining an entrance to said nip, the entrance having a wedge-shaped configuration leading to the nip whereby to apply a gradual force to the toner carried by the toner roller into the entrance leading toward the nip before squeeze thereof is initiated to develop the latent image primarily within said entrance as the belt passes through the toning station.

4,566,782

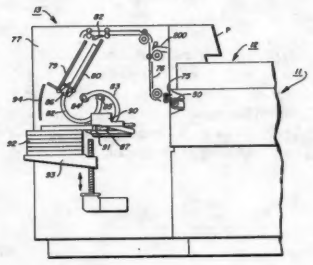
VERY HIGH SPEED DUPLICATOR WITH FINISHING FUNCTION USING DUAL COPY SET TRANSPORTS

James E. Britt, Penfield; Kenneth W. Laskowski, Pittsford; Jeffrey L. Sisson, Macedon, all of N.Y., and Stephen A. Rinehart, Vienna, Va., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,584

Int. Cl.[4] G03G *15/00;* B65H *39/10*

U.S. Cl. 355—14 SH 12 Claims



1. In a reproduction system having a copy sheet processor for reproducing information from document sheets onto copy sheets and means for producing the information in the form of an individual light image onto one or both sides of each copy sheet, the improvement including:

means for effecting the production of two successive light images of a side of each document sheet whereby the copy sheet processor produces an output of successive duplicate copy sheets,

a pair of sheet collecting trays arranged to receive copy sheets from the processor and to collate the same into sets of copies of different images,

means for transporting the copy sheet output of the processor and directing the same to said collecting trays alternately, and

a finishing apparatus adapted to receive the collated sets of copy sheets from said collecting trays alternately in timed sequence relative to the light images being reproduced and to bind the sets.

4,566,783

FIXING DEVICE

Peter P. Schwierz; Adolf Rebhan, both of Wiesbaden, and Roland Moraw, Wiesbaden-Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,424

Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317418

Int. Cl.[4] G03G *15/20*

U.S. Cl. 355—14 FU 11 Claims

1. A device for thermally fixing a toner image developed on a copying sheet with liquid developer in a copying apparatus, comprising:

a curved heating plate;

a guide roller disposed such that it guides the copy sheet carrying the toner image along the surface of said heating plate;

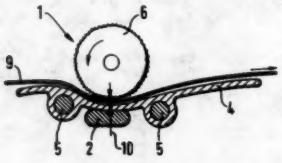
a temperature controlled, electric main heating means which is switched on when the copying process begins;

an electric standby heating means which maintains the heating plate at a constant temperature during standstill of the

copying apparatus, wherein both of said means are in contact with the heating plate; and

a control circuit;

wherein the standby heating means is connected to the supply voltage by a relay circuit and said relay circuit can be actuated by means of a main switch of the copying apparatus; and



wherein the relay circuit includes a biopolar relay for connecting the standby heating means to the supply voltage and the bipolar relay includes a low-voltage contactor with a self-holding contact as an operating contact and with a rest contact which remains closed until opened by the actuated low voltage contactor.

4,566,784

PHOTOGRAPHIC ROLLER COPYING APPARATUS WITH A DEVICE FOR THREADING A NEW PAPER TAPE

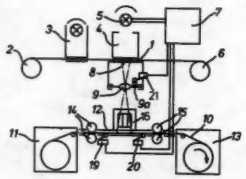
Wilhelm Nitsch, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,992

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339975

Int. Cl.⁴ G03B *27/58*

U.S. Cl. 355—72 **6 Claims**



1. A photographic copying apparatus for copying a roll film, comprising a printing station, platform for a negative, means for advancing a film over said printing station; drive means and guide means for advancing a tape copying material below said printing station; threading means for threading a starting end of a new tape of a copying material and provided on said drive and guide means, said threading means including a pivotable flap which periodically closes the tape in the region below said printing station when the advancement of the copying material is interrupted for duration of a threading process, said flap being formed with an opening for producing a test copy exposed in said opening in a contact process; and exposure control means for producing a test copy, said exposure control means exposing said test copy in said flap to empirically determined amounts of light when no negative is placed on said platform for a negative.

4,566,785

MAGAZINE FOR SUPPLYING A STRIP OF PHOTOGRAPHIC PRINTING PAPER

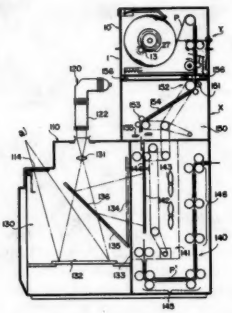
Toru Takenouchi, Wakayama, Japan, assignor to Noritsu Kenkyu Center Co., Ltd., Japan

Filed Mar. 21, 1984, Ser. No. 591,806

Claims priority, application Japan, Mar. 24, 1983, 58-41258[U]

Int. Cl.⁴ G03B *27/58*

U.S. Cl. 355—72 **11 Claims**



1. A detachable or replaceable magazine for supplying a strip of photographic printing paper to a photographic printer of photographic processor comprising;

a case constituting the magazine body,

a cover turnably mounted on the top of said case,

a printing paper delivering port formed on the case with a light shielding member displaceably fitted thereto,

a detachable or replaceable reel supporting member for supporting a reel wound with printing paper, said reel supporting member being adapted to rotate also in the direction of rewinding of the printing paper by the movement of a manual actuation member disposed outside the case,

a guide member for guiding movement of the printing paper strip while the side edges of said strip are fitted into vertically extending grooves formed on said guide member,

a printing paper delivering roller means including a pair of rollers and a ratchet wheel fixedly mounted on a roller shaft, said rollers being adapted to rotate to deliver the printing paper by the movement of a manual actuation member disposed outside the case and said ratchet wheel inhibits rotation of said roller in the reverse direction as required,

a printing paper detecting roller means for detecting the presence of printing paper and displacing a stopper plate in the direction of locking when no printing paper is present, said stopper plate serving to inhibit rotation of said printing paper delivering roller means in the reverse direction when it is brought into engagement with said ratchet wheel, and

an unlocking member adapted to be actuated in operative association with opening operation of the cover for unlocking said stopper plate from said ratchet wheel.

4,566,786

METHOD OF COPYING COLOR EXPOSURES

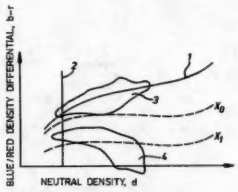
Manfred Fürsich, Taufkirchen; Helmut Treiber, Munich; Berthold Fergg, Taufkirchen; Günter Findeis, Sauerlach, and Wolfgang Zahn, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,323

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412881

Int. Cl.[4] G03B *27/32, 27/80*

U.S. Cl. 355—77 17 Claims



1. A method of copying color exposures comprising the steps of:

(a) measuring the densities of a multiplicity of regions of a selected exposure in each primary color;

(b) deriving a density differential for a selected region of a group of said regions by calculating the difference between the blue and red densities of said selected region, said selected region having a blue density which is a maximum for said group;

(c) classifying said selected exposure as to the probable type of illumination used to make the same by comparing a first value which includes said density differential with at least one reference value;

(d) assigning a correction factor to said selected exposure based on the result of the classifying step; and

(e) copying said selected exposure using said correction factor.

4,566,787

PHOTOCOPYING MACHINE

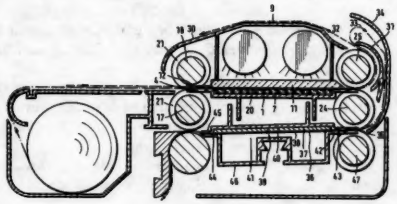
Georg Liillau, Hofkamp 2, 2123 Bardowick, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 572,162

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302475

Int. Cl.[4] G03B *27/30*

U.S. Cl. 355—100 10 Claims



1. A photocopying machine comprising a plain rigid light-transmitting plate (11), a flexible cellular plate (7) spaced from the light-transmitting plate to form a guide gap (20) therebetween, the surfaces forming the guide gap consisting of extremely low-friction material, feed elements comprising a pair of driving rollers (17, 18) for feeding copy material to the guide gap, said driving rollers forming a roller gap (19) therebetween and having peripheral grooves (22) selectively enlarging portions of the roller gap, and guide gap extenders (4, 12) having tongues (5, 13) projecting through said roller gap at said grooves, said tongues on opposite sides of said guide gap being spaced sufficiently for introducing copy material to said roller gap, said cellular plate including a flexible film (8) and flexible supporting means urging said film toward the light-transmitting plate over its entire surface.

4,566,788

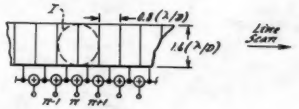
DETECTOR ARRAY

Carl J. Buczek, Encinitas, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 22, 1982, Ser. No. 443,844

Int. Cl.[4] G01C *3/08;* H01J *40/14*

U.S. Cl. 356—4 15 Claims



1. A detector array for sensing electromagnetic radiation of a predetermined wavelength directed thereto by an associated optical system including:

a plurality of individual detector elements, in a contiguous arrangement, each producing an electrical charge in response to the amount of electromagnetic radiation being direct to said individual detector elements; and

means for summing the electrical charge present on each detector element with the charge present on its immediately adjacent detector element and providing a summed output signal for each pair of adjacent elements.

4,566,789

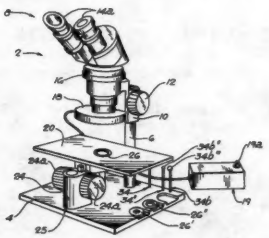
PANORAMIC VIEW BORE EXAMINING APPARATUS

William E. Weber, Highland Park, Ill., assignor to Radiation Equipment Company, Inc., Highland Park, Ill.

Filed Jul. 18, 1983, Ser. No. 514,574

Int. Cl.[4] G01N *21/88, 21/01*

U.S. Cl. 356—241 9 Claims



1. In a bore examining apparatus for examining the interior walls of articles having a through hole or bore passing completely therethrough along a bore axis, said apparatus including:

support means for supporting an article to be examined, said support means allowing free access to both ends of the bore passing through said article;

a reflector support disposed on one side of said article support means;

a reflector mountable on said reflector support, said reflector having a size and said support being located so that when the reflector is supported on said support said reflecting surface thereof can be positioned within the through hole of the article supported on said platform;

image magnifying means disposed on the other side of said article support means and positioned to be directable along said bore axis into the other end of said bore, said magnifying means being movable toward and away from said support means to focus on the image of the walls of said bore produced by said reflector; and

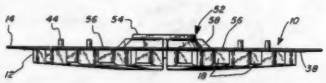
means for moving only said article support means relative to said reflector and said magnifying means to vary the field of view of said bore without varying the relative spacing of said reflector and magnifying means.

4,566,790

CUVETTE ARRAY

Richard M. Mandle, Pompton Lakes, N.J., assignor to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed Apr. 15, 1983, Ser. No. 485,174
Int. Cl.[4] G01N *1/10*
U.S. Cl. 356—246 **4 Claims**



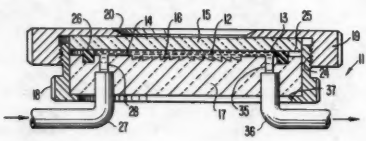
1. In a cuvette array for a centrifugal analyzer in which the array is formed from upper and lower discs of flexible thermoplastic material, the lower disc is formed with a plurality of compartments circumferentially spaced about a first central hub, and the upper disc is bonded to the outer periphery of the lower disc and closes off an outer peripheral portion of said compartments, the improvement wherein said upper disc is formed with a central portion that includes a second central hub positioned above said first central hub, and an intermediate web that bridges said second central hub to the outer peripheral portion of the upper disc so as to close off the inner peripheral portion of said compartments, and in which said second central hub is formed with indexing ribs thereon to engage corresponding channels in the lower disc of another cuvette array that is nested on top of the first-mentioned array, to restrain said arrays from relative rotation in the nested condition.

4,566,791

FLUID SAMPLE CELL COMPRISING FRESNEL SECTORS

Herbert Goldsmith, Rockville, Md., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Oct. 31, 1983, Ser. No. 547,239
Int. Cl.[4] G01N *1/10, 21/00, 15/06*
U.S. Cl. 356—246 **10 Claims**



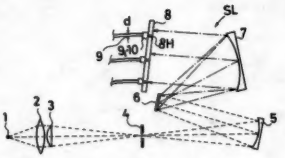
1. A fluid sample cell for the spectroscopic analysis of a fluid sample comprising a fluid-tight compartment for the containment of a fluid sample, said compartment being defined by a radiant energy transmissive top, a side wall and a bottom, wherein said bottom comprises a plurality of sectors of a Fresnel disc, whereby radiant energy passing through said compartment impinges upon at least one of said sectors and is specularly reflected from a reflecting surface of said sectors to respective focal points of said sectors.

4,566,792

MULTI-CHANNEL SPECTROPHOTOMETRIC MEASURING DEVICE

Jugoro Suzuki, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Feb. 4, 1983, Ser. No. 463,961
Int. Cl.[4] G01J *3/18, 3/42*
U.S. Cl. 356—319 **4 Claims**



1. A multi-channel spectrophotometric measuring device comprising:

a source of white light,

a slit plate provided with a slit extending in the X direction,

an optical system disposed between said source of white light and said plate for converging the white light from said light source through said plate,

spectral diffraction means for dispersing the light that travels through said slit plate into a spectral band,

an apertured plate having a front face and rear face for receiving on said front face thereof said spectrum band,

an array of holes through said plate for the passage therethrough of substantially monochromatic light of certain wavelengths,

said array of holes including a plurality of rows of holes, the holes of each row being spaced apart in the X direction along substantially the same band of the spectrum for the passage of substantially monochromatic light of the same wavelength and the rows being spaced apart in the Y direction so that the holes of different rows permit passage of substantially monochromatic light of different wavelengths,

a plurality of optical fibers for transmitting each substantially monochromatic light of different wavelength, the incident ends of said fibers being detachably mounted onto said holes provided on said rear face of said apertured plate,

a sector having a front face and rear face arranged with said front face facing the light emitting ends of the plurality of optical fibers for selectively transmitting each monochromatic light of different wavelength,

a separate optical fiber arranged on the side of said rear face of said sector for transmitting the substantially monochromatic light,

a separate optical system disposed between said sector and said separate optical fiber for directing the substantially monochromatic light selectively transmitted through said sector towards said separate optical fiber,

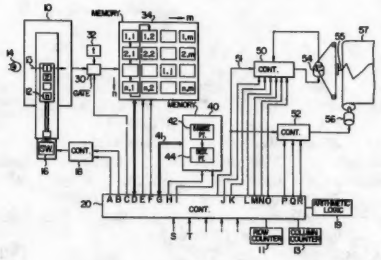
a sample cell at the light emitting end of said separate optical fiber, and

detector means for detecting the intensity of the light transmitted through said sample cell.

4,566,793
RECORDING APPARATUS FOR A SPECTROPHOTOMETER

Shigeo Tohyama, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,762
Claims priority, application Japan, Nov. 17, 1982, 57-201752
Int. Cl.[4] G01J 3/42
U.S. Cl. 356—319 7 Claims



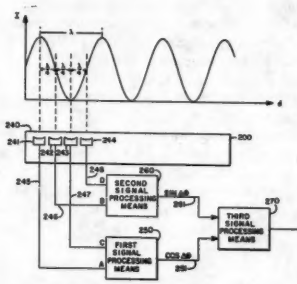
1. A spectrophotometer to draw time changes of a plurality of spectrophotometric data by one recording pen, comprising:
a plurality of sample cells for accommodating samples to be optically measured, each of said samples being repeatedly optically measured in a certain time interval;
a timer for providing a time when said sample is measured;
a first memory section for respectively memorizing each pair of said repetitive measured data and time;
a second memory section for memorizing data indicative of a source point of the movement of said pen and data representative of a destination point among each of said pairs memorized in said first memory section;
an arithmetic unit to calculate a difference between both measurement data for said destination point and source point and a time difference between said both measurement data and to provide an output of the calculation;
a controller for moving the pen in response to the output of said arithmetic unit; and
a controller for receiving the time difference from said arithmetic unit and for moving a recording sheet by an amount corresponding to the time difference synchronously with the movement of the pen by said controller after moving the recording sheet to a position corresponding to the previous measurement time for a currently measured sample with the pen in an up-state.

4,566,794
APPARATUS FOR INTERFERENCE FRINGE SHIFT SENSING

Joel G. Hanse, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 22, 1981, Ser. No. 256,631
Int. Cl.[4] G01C 19/64
U.S. Cl. 356—350 1 Claim

1. A fiber optic rate sensor comprising:
a source of radiation emitting at least one monochromatic electromagnetic wave;
an optical fiber wound around a defined input axis;
means for directing first and second portions of said wave to travel through said fiber in opposite directions and recombining said first and second portions after travel through said fiber so as to be capable of establishing an interference fringe pattern which varies in relation to rotation of said optical fiber;
detector means having at least first, second, third, and fourth detectors responsive to said interference fringe pattern for generating first, second, third, and fourth detector signals such that said first and second detector signals are substantially in phase quadrature to each other, said third and fourth detector signals are substantially in phase quadrature to each other, and said first and third detector signals are in opposite phase with each other; and
signal processing means having, first function means for providing an output signal indicative of the sum of said first and third detector signals,
second function means for providing an output signal indicative of the difference between said third and first detector signals,
third function means for providing an output signal indicative of the sum of said second and fourth detector signals,

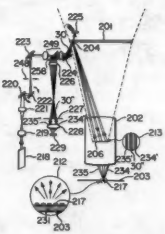


fourth function means for providing an output signal indicative of the difference between said second and fourth detector signals,
fifth function means for providing an output signal indicative of the ratio of said output signals of said first and second funcion means, and
sixth function means for providing an output signal indicative of the ratio of said output signals of said third and fourth function means; and
means for obtaining the arc tan value of the ratio of said fifth and sixth function means output signals thereby producing an output signal representative of the magnitude of movement of said interference fringe pattern movement.

4,566,795
ALIGNMENT APPARATUS

Toshio Matsuura, Koshigaya, and Kyoichi Suwa, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 348,716, Feb. 16, 1982, abandoned.
This application Mar. 6, 1984, Ser. No. 586,639
Claims priority, application Japan, Feb. 20, 1981, 56-22951
Int. Cl.[4] G01B 11/27
U.S. Cl. 356—400 4 Claims



1. An alignment apparatus for aligning a first substrate and a second substrate, comprising:
(a) first alignment mark means provided at a predetermined position on said first substrate and having a plurality of

short line segments arranged in a stripe pattern extended in a linear direction;

(b) second alignment mark means provided at a predetermined position on said second substrate and having a plurality of short line segments arranged in a stripe pattern extended in a linear direction;

(c) scanning means generating a scanning beam which scans said first alignment mark means along a scanning line having a predetermined angle with respect to said linear direction of said first alignment mark means and scans said second alignment mark means along a scanning line having a predetermined angle with respect to said linear direction of said second alignment mark means;

(d) means for receiving a part of said scanning beam divided by said first and second alignment mark means for form an output showing relative positional relation between said first and second alignment mark means;

(e) means responsive to said output showing relative positional relation to move at least one of said first and second substrates relative to the other; and

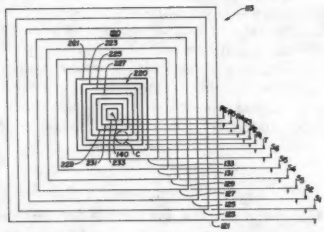
(f) an image-forming optical system disposed between said first end second substrates for projecting a pattern formed on said first substrate onto said second substrate, said scanning means projecting said scanning beam on said first substrate at a surface facing said image-forming optical system.

4,566,796

METHOD OF DETERMINING POSITION ON A WAFER

David H. Leebrick, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 24, 1983, Ser. No. 526,066
Int. Cl.[4] G01B *11/00*; G01N *21/86*
U.S. Cl. 356—401 **19 Claims**



1. A method for determining relative position and direction on a wafer comprising:

providing a target pattern on said wafer, said target pattern including at least one series of concentric figures, each of said figures having a particular dimension such that the difference between such particular dimensions of each pair of adjacent figures may be represented by a unique magnitude;

scanning said target pattern so as to determine said particular dimension of a first figure and the corresponding particular dimension of a second adjacent figure; and

determining the sign and magnitude of the difference of said first and corresponding particular dimensions with respect to said first figure and providing signals indicative of the position of said first figure with respect to a reference point in said target pattern from said determined sign and magnitude.

6. A target pattern for acquiring positional data from a wafer comprising:

a first and a second concentric series of concentric geometric figures, each of said figures in each of said series being spaced from adjacent figures by a predetermined amount and having at least one dimension whose differences in magnitude, with respect to corresponding dimension of adjacent figures, represents unique values and increases from the inner to the outer pair of adjacent figures;

said differences in magnitude being repeated in corresponding pairs of both of said series such that said increase in said differences in magnitude is also repeated in both of said series; and

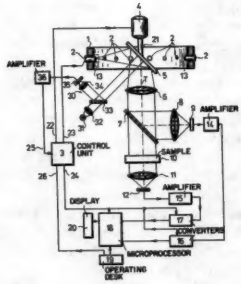
said spacing from adjacent figures being distinct between corresponding adjacent figures of each of said series.

4,566,797

SPECTROPHOTOMETER OPERATING AT DISCRETE WAVELENGTHS

Károly Kaffka; Béla Nádai; András Czabaffy, and Loránd Horváth, all of Budapest, Hungary, assignors to Kozponti Elelmiszeripari Kutato Intezet, Budapest, Hungary

Filed Jun. 9, 1983, Ser. No. 502,734
Claims priority, application Hungary, Jun. 9, 1982, 1869/82
Int. Cl.[4] G01J *3/42*
U.S. Cl. 356—402 **7 Claims**



1. A spectrophotometer operating at discrete wavelengths comprising in combination

several radiation emitting diodes emitting substantially monochromatic radiations of different wavelengths,

a holder for supporting said diodes,

an optical arrangement for transmitting the radiations emitted by said diodes towards a sample to be tested,

means for changing the angular position of said optical arrangement thereby to transmit said radiation toward said sample successively,

means for operating said diodes corresponding to the angular position of said optical arrangement and providing operational data about the diodes,

a first radiation detector sensing the intensity of the radiation reflected or transmitted by the sample,

a beam splitter positioned before the sample in the path of the radiation beam transmitted towards the sample,

a second radiation detector sensing the intensity of the radiation diverted by the beam splitter,

a first analog-to-digital converter to produce a digital signal corresponding to the signal of the first radiation detector,

a second analog-to-digital converter to produce a digital signal corresponding to the signal of the second radiation detector,

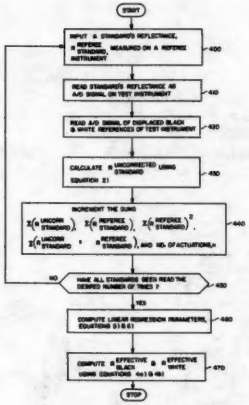
a data processing unit connected to the output of the first and second analog-to-digital converters, said unit computing spectrum data on the basis of the digital signals of said first and second analog-to-digital converters and said operational data.

4,566,798

METHOD FOR CALIBRATING A REFLECTOMETER CONTAINING BLACK AND WHITE REFERENCES DISPLACED FROM THE SAMPLE POSITION

Daniel D. Haas, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,692
Int. Cl.[4] G01N *21/55;* G01J *1/02*
U.S. Cl. 356—448 3 Claims


START
INPUT A STANDARD'S REFLECTANCE, a REFENCE STANDARD, MEASURED ON A REFENCE INSTRUMENT
400
READ STANDARD'S REFLECTANCE AS A/D SIGNAL ON TEST INSTRUMENT
410
READ A/D SIGNAL OF DISPLACED BLACK & WHITE REFERENCES OF TEST INSTRUMENT
420
CALCULATE a UNCORRECTED USING STANDARD EQUATION 21
430
INCREMENT THE SUMS
440
HAVE ALL STANDARDS SETS READ THE DESIRED NUMBER OF TIMES ?
NO
YES
450
COMPUTE LINEAR REGRESSION PARAMETERS, EQUATIONS 31 & 41
460
COMPUTE a EFFECTIVE BLACK & a EFFECTIVE WHITE USING EQUATIONS 42a & 42b
470
STOP

1. A method of calibrating a reflectometer containing a black reference and a white reference that are detected in a first location that is placed at a distance from the light source of the reflectometer that is optically different from the distance of the location of test elements from said light source when positioned for detection, said method featuring calibration factors representing the effective reflectances for each of said references which compensate for said optically different distances of such test elements and said black and white references,

said method comprising the steps of

(a) selecting a dark standard and a light standard;

(b) ascertaining, on a second reflectometer, the reflectance of the dark standard and the light standard;

(c) measuring an analog or digital signal for both of said standards at a distance from said light source that is optically the same as said test element distance location using said first reflectometer;

(d) calculating a linear relationship between the reflectances of step (b) and the signals of step (c);

(e) measuring on said first reflectometer an analog or digital signal for both of said references while in said first location;

(f) ascertaining the corresponding effective reflectances from said linear relationship, using said signals measured in step (e); and

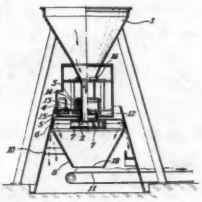
(g) calibrating said reflectometer using said effective reflectances as said calibration factors.

4,566,799

APPARATUS FOR ADJUSTING THE QUANTITY OF LIQUID DEPOSITED ON FINE GRANULAR MATERIALS AND METHOD OF PREPARING MORTAR OR CONCRETE

Yasuro Ito, 38-16, Numabukuro 4-chome, Nakano-ku, Tokyo, and Yoshiro Higuchi, Tokyo, both of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Continuation of Ser. No. 468,294, Feb. 22, 1983, abandoned, which is a division of Ser. No. 134,210, Mar. 26, 1980, Pat. No. 4,384,787. This application Apr. 1, 1985, Ser. No. 717,593
Claims priority, application Japan, Jun. 28, 1979, 54-80807; Oct. 1, 1979, 54-126587; Oct. 29, 1979, 54-138645; Nov. 16, 1979, 54-147628
Int. Cl.[4] B28C *7/00*
U.S. Cl. 366—1 26 Claims



1. An apparatus for adjusting the water content of fine aggregate comprising:

means for continuously supplying a quantity of fine aggregate having a quantity of water deposited on a surface thereof;

projecting means for imparting a velocity energy to the supplied fine aggregate, thereby projecting said fine aggregate in a predetermined direction or directions;

an impact body having a continuous surface with which the projected fine aggregate comes into collision to apply thereto an impact force stronger than the adhesive force of the water to said fine aggregate at the time of collision, thereby separating an excessive portion of said quantity of water deposited on the surface of said fine aggregate such that after collision said fine aggregate from which said excessive quantity of water has been removed is collected and said separated water is first deposited on said surface of said impact body and then discharged to the outside of said apparatus;

a receptacle for collecting said fine aggregate from which said quantity of water has been separated; and

a trough for receiving said separated water which flows down along said surface of said impact body.

4,566,800

SONIC DEVICE FOR EXTRACTING MINERALS FROM ORE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Jan. 13, 1984, Ser. No. 570,394
Int. Cl.[4] B01F *11/00;* B06B *1/16*
U.S. Cl. 366—118 5 Claims

1. A device for generating sonic energy for use in extracting minerals from ore placed in a liquid such as a leaching solution contained in a tank, and the like, said device being mounted in said tank, and comprising

a housing,

an elongated bar member,

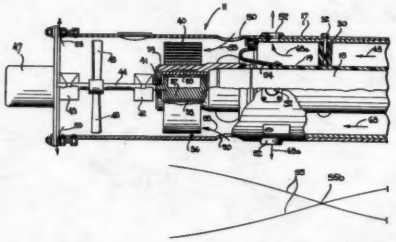
means for supporting said bar member in said housing,

an orbiting mass oscillator attached to one end of said bar member, and

means for driving said oscillator at a frequency such as to set up resonant standing wave vibration of said bar member,

said means for supporting said bar member in said housing

comprising a bore formed in the bottom end of said bar member along the longitudinal axis thereof, support means supported at one end thereof on said housing, said support means being fitted in said bore and in contact with said bar member solely at a point therealong where a node of said standing wave pattern appears, said support means comprising a support rod having cylindrical separator sleeves at the opposite ends thereof, said sleeve having a greater diameter than that of said support rod, receptacle means mounted on the bottom of said housing for receiving one of said sleeves, the other of said sleeve fitting snugly within an upper portion of the bore formed in said bar member, and cushioning means for cushioning said sleeves against said receptacle means and said bore and cushioned spoke means extending from said housing and in abutment against said bar member at at least one point therealong



where a node of the standing wave pattern appears for centering said bar member and preventing the rotation thereof.

3. A method for extracting minerals from ore comprising the steps of

feeding ore material mixed in a liquid to a container,

generating sonic energy with an orbiting mass oscillator,

coupling the sonic energy to one end of an elastic bar to resonantly vibrate said bar to effect a quadrature nutating standing wave vibration pattern therein,

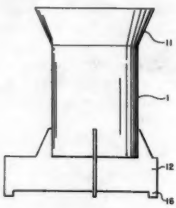
said bar having a longitudinal bore formed therein, and being supported in a vertical orientation by means inserted in said bore, said bar being supported in gravity compression against said means inserted in said bore which means contacts said bar only at a node of the standing wave vibration pattern established therein.

4,566,801

SUBMERSIBLE MIXER ALIGNABLE IN A HORIZONTAL OR VERTICAL MODE

Ronald N. Salzman, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 18, 1984, Ser. No. 662,323
Int. Cl.[4] B01F *5/10*
U.S. Cl. 366—343 **8 Claims**



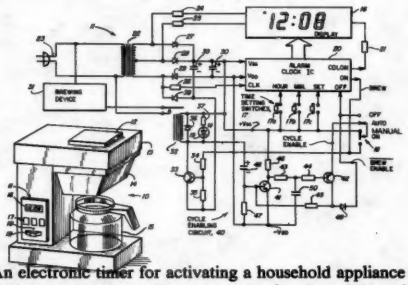
1. A submersible mixer which comprises a housing, an impeller rotatably mounted on said housing, a drive means for said impeller in said housing, a support for said housing, said support having a plurality of vanes at one end of said support defining a stand for aligning said housing with the axis of rotation of said impeller vertical, said support having an extension at the end of said support opposite to said vanes, said extension defining at least one point of support in a horizontal plane, said vanes defining at least two other points of support in said horizontal plane for aligning said housing with said axis of said impeller horizontal.

4,566,802

ELECTRONIC CYCLE TIMER FOR A HOUSEHOLD APPLIANCE

Gerald C. Koehler, Peru, Ill., assignor to Worldtronics International, Inc., Oglesby, Ill.

Filed Aug. 16, 1984, Ser. No. 641,789
Int. Cl.[4] A23F *0/00*
U.S. Cl. 368—9 **20 Claims**



1. An electronic timer for activating a household appliance for a limited duration upon the occurrence of a selected time of day, said timer having an integrated circuit including

(a) an internal clock registering the time of day and means for setting the registered time to the correct local time,

(b) an internal register storing a preset activation time and means for setting the activation time to a selected time, and

(c) means for generating an activation signal for said limited duration upon the coincidence of the time of day registered by the internal clock and the preset activation time when an activation enable signal is present,

wherein the improvement comprises means for preventing said household appliance from being activated on a daily basis in the absence of manual intervention including, in combination,

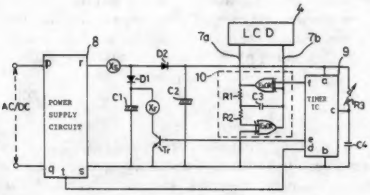
means for receiving from the user a cycle enable signal, and

cycle enabling means for generating the activation enable signal in response to the cycle enable signal, said cycle enabling means including a bistable circuit determining the logic state of the activation enable signal, wherein said bistable circuit is set upon the occurrence of the cycle enable signal being received from the user to generate an active activation enable signal, and said bistable circuit is automatically reset by said activation signal to generate an inactive activation enable signal thereby preventing said household appliance from being reactivated unless a cycle enable signal is thereafter received from the user.

4,566,803
POWER SOURCE OFF DELAY TIMER WITH LIQUID CRYSTAL DISPLAY

Tetuya Waniisi; Hiroshi Sato, both of Okayama, and Isao Nanba, Kurashiki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 26, 1984, Ser. No. 654,490
Claims priority, application Japan, Sep. 27, 1983, 58-149161[U]
Int. Cl.[4] G04B 9/00; G04F 8/00
U.S. Cl. 368—66 5 Claims



1. A power source off delay timer, for generating an off delay output after passage of a determinate time delay period from when an input power source is switched off, comprising:

(a) a main body;

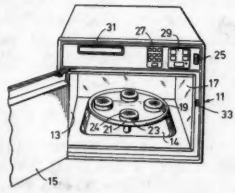
(b) a liquid crystal display mounted to said main body so as to display the operational condition of said timer; and

(c) a liquid crystal display drive unit for driving said liquid crystal display during the time that said power source is on and also during said determinate time delay period between the time instant at which said power source is switched off and the time instant at which said timer generates said off delay output.

4,566,804
APPARATUSES, PROCESSES AND ARTICLES FOR CONTROLLABLY HEATING AND DRYING MATERIALS BY MICROWAVE RADIATION

Michael J. Collins, and Wyatt P. Hargett, Jr., both of Matthews, N.C., assignors to CEM Corporation, Matthews, N.C.

Filed Dec. 16, 1982, Ser. No. 450,198
Int. Cl.[4] G01N 25/00; G01G 23/18
U.S. Cl. 374—14 9 Claims

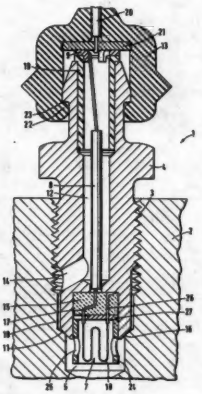


1. A process for analyzing a thermally sensitive material for its content of volatilizable component(s) without causing degradation of such material so as to cause removal of more than the volatilizable component(s) therefrom which comprises making a mixture of the thermally sensitive material to be analyzed and a compatible inert and thermally stable dispersant material by dispersing such material to be analyzed, in particulate or powder form, in such dispersant material, which is in particulate or powder form, placing the mixture of such materials on a movable support, at least a portion of which is microwave absorptive so that it is heated by microwave radiation and heats the thermally sensitive material being analyzed, and becomes microwave transmissive at a temperature below that at which the thermally sensitive material is degraded, weighing such mixture of thermally sensitive material and dispersant material, on or off the support, controllably heating such mixture of materials by microwave radiation to drive off the volatilizable component(s) without causing thermal degradation of the thermally sensitive material, and weighing the remaining mixture of materials, on or off the support, which mixture is that from which the volatilizable component(s) had been driven off.

4,566,805
DEVICE FOR DETERMINING AND CHECKING CONDITION STATE AND OTHER PARAMETERS OF A PRESSURE FLUID

Hans-Christof Klein, Hattersheim, and Hans Hohmann, Fulda, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 10, 1984, Ser. No. 608,787
Claims priority, application Fed. Rep. of Germany, May 14, 1983, 3317638
Int. Cl.[4] G01N 25/08
U.S. Cl. 374—16 8 Claims



1. A device for mounting a hydraulic pressure fluid condition measuring device in a hydraulic system of a vehicle comprising:

a body in the form of a bleeder screw adapted to be screwed into a component of the hydraulic system and including an axial bore defining a vent line, said bleeder screw including means for connecting said hydraulic system to said vent line when partially screwed into said component and for disconnecting said hydraulic system from said vent line when fully screwed into said component;

a first electrical contact element at an outermost end of said screw, said first contact element electrically insulated from said body and electrically coupled to said measuring device;

a second electrical contact in the form of a metallic disc within an electrically insulative, protective cap on the outermost end of said screw over said axial bore, said disc in electrical contact with said first contact and electrically coupled to an external lead extending through said cap;

said screw including means at an end opposite said outermost end thereof for mounting said measuring device in flow communication with said pressure fluid.

4,566,806

METHOD AND DEVICE FOR CONTROLLING THE CURING RATE OF CONCRETE

Dick DeBondt, No. 6, De Ruyterstraat, Rijsen, Netherlands

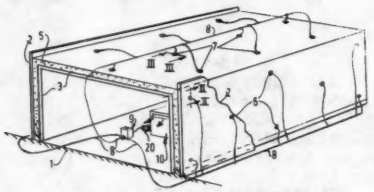
PCT No. PCT/NL82/00038, § 371 Date May 31, 1983, § 102(e) Date May 31, 1983, PCT Pub. No. WO83/01411, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 22, 1982, Ser. No. 504,044

Claims priority, application Netherlands, Oct. 23, 1981, 8104811

Int. Cl.⁴ G01N *3/26*

U.S. Cl. 374—53 **8 Claims**



1. A method of curing concrete to a desired value of cure accumulated over a specified period of time subsequent to pouring thereof, which desired value of cure would not be accumulated over said specified period of time under normal conditions, which comprises the steps of:

(a) controlling the temperature of the concrete over an initial period of time while the concrete progressively cures to an assessed degree of partial cure thereof which, when augmented by that additional curing calculated to occur by the end of said specified period of time on the basis of an expected temperature variation of the concrete in the absence of such control, will yield said desired value of cure; and

(b) monitoring further progressive curing of the concrete after said initial period of time and in the absence of said control by measuring temperature variation of the concrete and comparing it with said expected temperature variation to detect disparity between said further progressive curing and said additional curing as calculated, and further controlling the temperature of said concrete when such disparity is detected as would otherwise cause the concrete to accumulate a further progressive curing significantly different from said additional curing as calculated.

4,566,807

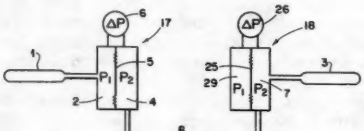
APPARATUS AND METHOD FOR ACCURATELY MEASURING TEMPERATURES AND TEMPERATURE DIFFERENCES

Johannes L. A. Kooien, Terneuzen, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 9, 1984, Ser. No. 578,441

Int. Cl.⁴ G01K *3/00*

U.S. Cl. 374—112 **2 Claims**



1. An apparatus for accurately measuring differences in temperature, which comprises:

a first cell that comprises a bulb in fluid communication with a first chamber, the bulb and chamber contains a fluid (F_1), at least a portion of one wall of the first chamber defines a diaphragm, the side of said wall opposite to the first chamber provides at least a portion of the wall of a second chamber;

a means for measuring the difference in pressure between the first and second chambers of the first cell;

a second cell that comprises a bulb in fluid communication with a first chamber, the bulb and chamber contains a fluid (F_2), at least a portion of one wall of the first chamber defines a diaphragm, the side of said wall opposite to the first chamber provides at least a portion of the wall of a second chamber having a known pressure;

a means for measuring the difference in pressure between the first and second chambers of the second cell; and

the second chamber of the first cell is in fluid communication with the first chamber of the second cell.

4,566,808

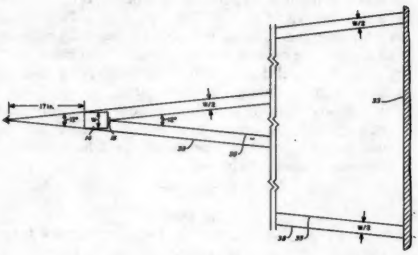
SCANNING RADIATION DETECTOR

Francesco Pompei, Wayland, and Shiraz Daya, Franklin, both of Mass., assignors to Exergen Corporation, Natick, Mass.

Filed Feb. 16, 1983, Ser. No. 466,789

Int. Cl.⁴ G01K *1/02*; G01J *5/10*

U.S. Cl. 374—124 **20 Claims**



15. A method of detecting radiation from a surface area comprising holding a radiation detector housing in the field of view between the user's eye and the surface area from which radiation is being detected, a predetermined transverse dimension of the housing across the line of sight in said field of view, with the housing held a predetermined distance within arm's length from the user's eye, defining a field of view which approximates the predetermined field of view of a radiation sensor centrally positioned relative to said transverse dimension at an end of the housing opposite to the user's eye, and detecting radiation from the surface area by display means of the radiation sensor.

4,566,809

INFRA-RED RADIATION TEMPERATURE MEASUREMENT OF A MOVING WIRE

Robert Arnaud, La Celle-Saint-Cloud, France, assignor to Mecilec, France

Continuation-in-part of Ser. No. 323,770, Nov. 20, 1981, abandoned. This application Feb. 13, 1984, Ser. No. 579,591

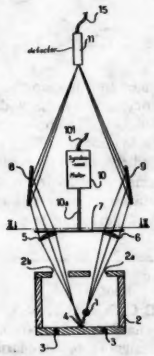
Claims priority, application France, Jan. 16, 1981, 81 00831

Int. Cl.⁴ G01J *5/10, 5/62*

U.S. Cl. 374—126 **4 Claims**

1. A process of measuring by infra-red thermometry means the temperature of a body, such as a wire, bar or the like, in lengthwise movement in a black background of a heated insulated high thermal conductive enclosure constituting a black body and emitting infra-red radiation, said process comprising the steps of: effecting a pair of optical emissive radiation paths through two spaced windows of the enclosure, one of said

optical paths located in a portion of said body with said wire interrupting a first one of said paths and a zone of said black background encompassing said portion of the body, and another second path of said optical paths located in a zone of said black background equivalent to said zone encompassing said body; directing by a first and second reflective mirror means onto the sensitive surface of an infra-red detector the infra-red emissive radiation coming from said body and the zone of said black background encompassing it, and the infra-red emissive radiation coming from said equivalent zone of said black background only when there is no wire present in the black background body; successively interrupting with a notched disc said two infra-red radiations; processing with an electronic circuit the output signal of said infra-red detector representative of the temperature of said body with respect to the temperature of said zone of the black background, said electronic circuit delivering a positive, negative or zero output signal depending on whether said body is hotter or colder than, or at the same temperature as, said zone of black background; wherein said process further comprises the steps of effecting



each of said optical paths that first pass through said windows to then pass through two infra-red transparent convergent lenses; directing the infra-red radiation resulting from each of said optical paths on said infra-red detector with a separate plane mirror; placing said notched disc close by said lenses; rotating said notched disc so that the notches cause the image transmitted from a first path of said optical paths to progressively appear on said infra-red detector while causing the image transmitted from the second path to progressively disappear in a synchronized manner until the instant where there appears on said detector only the image from the first path which immediately disappears progressively, whereas there appears progressively on said infra-red detector the image from the second path, until the instant when there appears on said infra-red detector only the image of the second path, said disc notches being arranged so that an obstructed surface of one of said lenses being equal to an open surface of the other lens, and wherein, in the absence of said body, said process further comprises the step of leading said two optical paths to a same region of said black background.

4,566,810

STEAM TURBINE ROTOR SHAFT

Takatoshi Yoshioka; Seishin Kirihara; Masao Shiga; Katsumi Iijima; Katsukuni Hisano, and Ryoichi Kaneko, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

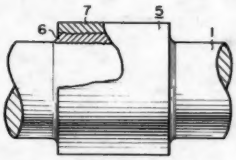
Filed Apr. 12, 1983, Ser. No. 484,204

Claims priority, application Japan, Apr. 14, 1982, 57-61009

Int. Cl.[4] F16C *33/04, 33/08, 33/14*

U.S. Cl. 384—280 **2 Claims**

1. A steam turbine rotor shaft comprising a shaft formed of forged and precipitation-hardened austenite steel consisting essentially, by weight, of 0.01–0.10% C, not more than 1.0% Si, not more than 2.0% Mn, 12–16% Cr, 24–27% Ni, 0.5–1.5% Mo, 1–2.5% Ti, 0.2–0.4% Al, 0.1–0.4% V and the balance substantially Fe, said austenite steel having as a whole austenite structure having a γ′ phase precipitated therein, and a metal member of better bearing characteristics than such forged austenite steel provided on an outer surface of a bearing portion of a journal section of said shaft, said metal member comprising a plurality of layers of build-up welding applied directly to said shaft including a first layer formed by use of a welding rod of a Ni base alloy consisting essentially, by



weight, of 0.01–0.1% C, 0.5–3.5% Mn, 0.2–1.0% Si, 0.2–1.0% Cu, 60–75% Ni, 0.2–1.0% Al, 1.5–3.0% Ti, 10–20% Cr, 0.5–1.5% Nb and the balance substantially Fe, while a second layer and succeeding layers are formed by use of welding rods of low alloy steel consisting essentially, by weight, of not more than 0.1% C, not more than 1.0% Si, not more than 2.0% Mn, 0.3–3.0% Cr, nor more than 2.0% Mo and the balance substantially Fe such that a surface of said metal member to be in contact with a bearing is formed of low alloy steel containing Cr of 0.3–3.0 weight percent.

4,566,811

DEVICE FOR SEALING A SELF-ALIGNING ROLLING BEARING

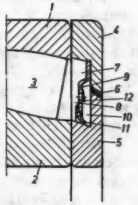
Bengt Lundgren, Lerum, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Feb. 25, 1985, Ser. No. 705,131

Claims priority, application Sweden, Apr. 24, 1984, 8402234

Int. Cl.[4] F16C *33/78*

U.S. Cl. 384—484 **5 Claims**



1. A device for sealing a self-aligning rolling bearing having an outer (1) and an inner (2) ring, one of which having a spherical raceway surface, and a number of rolling bodies (3) arranged between the rings and rolling against raceways provided on the rings, the device comprising annular sealing bodies (4, 5) arranged co-axially on the end surfaces of the respective bearing rings, the bodies co-operating with each other for sealing the space between the raceways and being provided with opposing, mainly spherical surfaces which delimit a gap (6) separating the sealing bodies, characterized in that the sealing bodies are provided with co-axial annular recesses (7, 8) connecting to each other and constituting an axial extension of the space between the raceways in connection to said gap, and that an annular member (9) in said recesses delimits an annular space (10) therein, the member (9) being fixed to one sealing body (4) and provided with a sealing lip

(11) co-operating with a mainly spherical surface on the other sealing body (5).

4,566,812

SEALING MEANS FOR A BEARING FOR STRUT-TYPE SUSPENSION

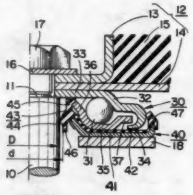
Kenji Takei, Hiratsuka, and Yukihiro Akabane, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,974

Claims priority, application Japan, Aug. 31, 1983, 58-135265[U]

Int. Cl.⁴ F16C *33/76, 33/58*

U.S. Cl. 384—484 **4 Claims**



1. A sealing means for a rolling bearing for a strut-type suspension comprising:

a piston rod for a shock absorber, the piston rod having an outer surface;

a rubber mount fixed to the piston rod, the rubber mount having an upper and a lower plate;

a coil spring which encircles the piston rod;

an upper spring for a first end of the coil spring, the upper spring seat being mounted about the piston rod;

a stationary bearing ring having an arcuate outer radial portion defining an interior curve and a radial inner marginal portion, the marginal portion secured to the piston rod in fixed contact with the lower plate of the rubber mount;

a rotary bearing ring fixed to the upper spring seat and being rotatable therewith, the rotary bearing ring having a radial inner end portion and a radial outer portion which extend into the interior curve defined by the arcuate outer radial portion of the stationary bearing ring, the rotary bearing ring and the stationary bearing ring cooperating to define a bearing assembly; and

a sealing member for the bearing assembly integral therewith, the sealing member having (1) a first lip formed at a radial inner side thereof, the first lip slidably contacting the outer surface of the piston rod, the first lip including a coupling head which couples with the radial inner end portion of the rotary bearing ring to render the sealing member integral with the bearing assembly and (2) a second lip formed at the radial outer side of the sealing member, the second lip contacting the stationary bearing ring.

4,566,813

DOT-MATRIX PRINT CONTROLLER

Toyohiro Kobayashi; Shoji Mochizuki; Mitsuru Murata; Shunji Tsuboi, and Hideto Sakurai, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

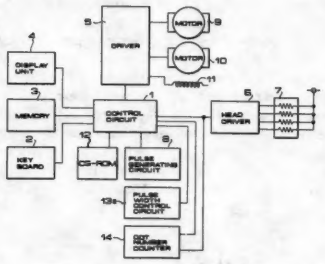
Filed Sep. 26, 1984, Ser. No. 654,496

Claims priority, application Japan, Sep. 27, 1983, 58-178487; Oct. 3, 1983, 58-184617; Oct. 14, 1983, 58-159009[U]

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—120 **6 Claims**

1. A print controlling for a dot-matrix printer having a keyboard for entering characters to be printed, a memory for storing temporarily print data entered through said keyboard, a display unit for displaying the contents of said memory, a pulse generating circuit for generating current pulses applied to a print head, a dot-matrix thermo-sensitive print unit and a control circuit for controlling said memory, display unit, pulse generating circuit and print unit, said print unit having an operational mode of printing a keyed-in character immediately and an operational mode of storing keyed-in characters in said memory and printing the stored characters continuously, said print controller further comprising a counter for counting the



number of dots of one character in accordance with the print data stored in said memory, and a pulse width control means for reducing the width of the pulse applied to said print head when the count value of said counter is large and incressing the width of the pulse applied to said print head when the count value of said counter is small in order to make the thickness of printing constant, and said pulse width has an upper limit and a lower limit for control of increasing or decreasing the width of the applied pulses.

4,566,814

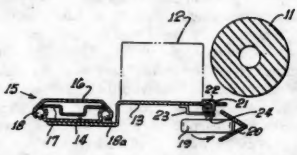
PRINT HEAD CARRIAGE ASSEMBLY

John E. Papp, Anaheim, and Bienvenido Nepomuceno, Diamond Bar, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.

Filed Apr. 6, 1983, Ser. No. 482,458

Int. Cl.⁴ B41J *19/00*

U.S. Cl. 400—354.1 **15 Claims**



1. In a printing device of the type having a platen mounted on a frame and a moveable print head mounted on a platform of a carriage assembly which is driven in a path parallel to the platen wherein the improvement comprises:

a precision, linear, ball-bearing slide having an outer race member, an inner race member having said platform of said carriage assembly affixed thereto and a ball retainer, said slide being mounted on said frame so that said slide is parallel to said platen;

platen receiving means affixed to said frame;

a support arm affixed to said platform of said carriage assembly;

guide means including channel means which channel means is affixed to said frame, said channel means of said guide means being mounted so that said guide means is parallel to both said platen and said slide, said guide means further having roller means engaging said channel means and said roller means being moveable along said channel means

and being rotatably affixed to the support arm of said platform; and

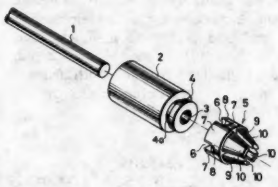
biasing means between said inner race member and the roller means of the guide means.

4,566,815

STRUCTURE FOR MOUNTING ROLLER ON SHAFT

Hiroshi Matsumoto, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,181
Claims priority, application Japan, Nov. 19, 1982, 57-175146
Int. Cl.⁴ B41J *13/02*
U.S. Cl. 400—641 **10 Claims**



1. A structure for mounting a roller on a shaft, comprising:

a shaft,

a roller mounted on the shaft, and

a retaining element mounted on the shaft so as to be opposed to the roller for retaining the roller in a given axial position on the shaft,

the roller being loosely mounted on the shaft so as to be rotatable thereon, the roller having a flange at one end thereof,

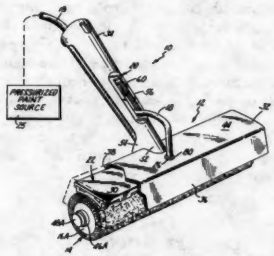
the retaining element having a plurality of resilient retaining arms at one end thereof to retain the flange rotatably, the retaining element also having a plurality of resilient arms at the other end thereof, the latter resilient arms being in frictional engagement with the outer periphery of the shaft.

4,566,816

PRESSURE FED PAINT ROLLER

Robert I. Janssen, St. Paul, Minn., assignor to Padco, Inc., Minneapolis, Minn.

Filed Aug. 29, 1983, Ser. No. 527,412
Int. Cl.⁴ B05C *17/02*
U.S. Cl. 401—219 **21 Claims**



1. A pressure fed paint roller apparatus comprising:

a paint roller having a paint applying outer covering;

means for mounting the paint roller for rotation of the paint roller about an axis;

a paint supply tube for supplying paint under pressure;

a manifold having an inlet connected to the paint supply tube, a concave paint spreading surface facing the paint roller, a chamber within the manifold which includes an elongated main channel extending generally parallel to the axis of the paint roller and an auxiliary channel which communicates with the inlet and which is connected to the main channel at a plurality of spaced locations, and a row of spaced discharge openings extending from the main channel to the paint spreading surface through which paint is discharged from the chamber; and wherein the manifold comprises:

a first member which has the inlet connected thereto and has a first mating surface;

a second member having the concave paint spreading surface, having a second mating surface for mating with the first mating surface and having the row of spaced discharge openings therein;

wherein the main and auxiliary channels are formed in one of the mating surfaces; and

means for releasably connecting the first and second members together so that when joined together in normal operating position, the first and second mating surfaces and the main and auxiliary channels define the chamber, and so that the upper and lower manifold plates are separable to expose the paint distribution channel and the first and second mating surfaces for cleaning; and

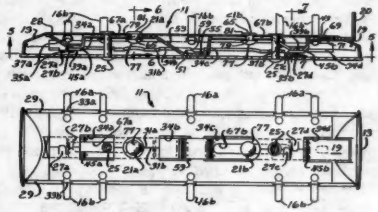
means for urging the manifold toward the roller to cause the paint spreading surface to engage the paint roller for spreading paint evenly onto the outer covering of the paint roller.

4,566,817

RING BINDER

Arthur M. Barrett, Jr., 950 Telegraph Rd., Lake Forest, Ill. 60045

Filed Jan. 16, 1984, Ser. No. 570,840
Int. Cl.⁴ B42F *3/04, 13/16, 13/30*
U.S. Cl. 402—38 **19 Claims**



1. A loose-leaf binding mechanism, of the type affixed to covers and a backbone structure, comprising:

a housing adapted to be affixed to a backbone structure and having an upper wall extending the length of said housing and spaced apart from the backbone structure;

a pair of hinge plates, each hinge plate pivotally coupled to said housing for movement between a first position with said hinge plates positioned in proximity to said housing and a second position with said hinge plates positioned distally from said housing;

ring binding means having two opposing portions, each of said opposing portions affixed to opposite hinge plates in cooperating relationship to open and close with the movement of said hinge plates;

control bar means slideably affixed to said housing, moveable between a first control bar position and a second control bar position, said control bar means further including cam means, said cam means positioned to engage said hinge plates for applying a force in one direction to move said hinge plates toward said housing as said control bar means is moved to said first position, and positioned to engage said hinge plates for applying a force in the opposite direction to move said hinge plates away from said

housing as said control bar means is moved to said second position; and

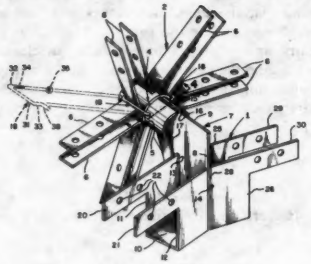
control bar affixing means suspending said control bar means from said upper wall of said housing for sliding movement therealong between said control bar positions whereby said control bar works against said upper wall of said housing through said control bar affixing means and independent of said backbone structure in applying forces to said hinge plates.

4,566,818

LEDGER HANGER FOR GEODESIC DOMES

Victor M. Schwartz, Berkeley, and Robert G. Miller, San Mateo, both of Calif., assignors to Timberline Geodesics, Inc., Berkeley, Calif.

Filed Aug. 1, 1983, Ser. No. 519,385
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 403—172 **2 Claims**



1. A pair of hangers for supporting a ledger member adjacent to the upstanding inwardly slanting sidewall forming the structural shell of a geodesic dome in combination with at least two spaced metal hub connectors positioned at approximately the same elevation and used in constructing said structural shell wall, said metal hub connectors being formed with an elongated hub having an elongated inner opening and said hub being connected to metal arms which are attached to wood strut members forming said structural shell wall for said geodesic dome, said hanger comprising:

a. a flange member having a hanger supporting portion and a hub connection portion projecting therefrom;

b. a first hanger seat connected at a generally right angle to said hanger supporting portion of said flange for supporting an end of said ledger member;

c. first hanger sidewall members extending from said first hanger seat and connected to said seat and said flange member;

d. adaptor means connected to said hub connection portion of said flange member and releasably connected to said elongated hub of said hub connector within said elongated inner opening of said hub;

e. said adaptor means and said flange member dimensioned to position said hanger seat a selected distance from said structural shell to prevent interference of said ledger member and floor beam members with said inwardly slanting structural shell of said dome;

f. coupling means releasably coupling said adaptor means to said elongated hub of said hub connector;

g. first strap members connected to said first hanger sidewall members and extending outwardly therefrom and having bolt holes formed therein for receipt of bolts therethrough;

h. said bolts connect each end of said ledger member to said hangers thereby structurally stiffening said geodesic shell;

i. a second hanger seat connected to said hanger supporting portion of said flange member disposed on the opposite side of said flange member from said first hanger seat and disposed at an angle thereto;

j. second hanger sidewall members extending from said second hanger seat and connected to said second seat and said spline member;

k. second strap members connected to said second hanger sidewall members and extending outwardly therefrom and having bolt holes formed therein for receipt of bolts therethrough;

l. said bolts connect each end of said ledger member to said hangers;

m. said adaptor means includes a tubular cylinder connected to said flange member;

n. said coupling means consists of at least one U-shaped pin member formed with a substantially straight base member and two angularly related parallel legs having at least one threaded end and said base member having a length greater than the length of said elongated hub; and

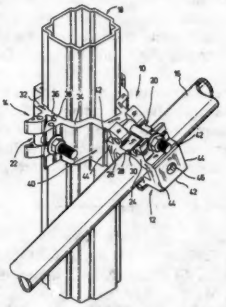
o. said tubular cylinder is formed with at least one pair of openings spaced for registered receipt of said legs of said U-shaped pin.

4,566,819

CLAMP FOR SHORING AND SCAFFOLDING FRAMES

Ronald J. Johnston, Georgetown, Canada, assignor to Aluma Systems, Incorporated, Downsview, Canada

Filed Mar. 1, 1982, Ser. No. 353,424
Int. Cl.⁴ F16B *7/00*
U.S. Cl. 403—385 **55 Claims**



1. A clamp arrangement for connecting elongate rigid structural elements comprising two clamps which are capable of being interconnected either for rotation between the two clamps or for positioning of the clamps in at least one predetermined fixed relative position, each clamp having a clamp body which is releasably closeable to surround and clamp a respective structural member, at least one of said clamps in the area of interconnection having at least one portion which is adapted to be secured to position said clamps in said at least one predetermined fixed relative position, and means cooperating with and containing said at least one portion for securing said clamps in said at least one position.

4,566,820

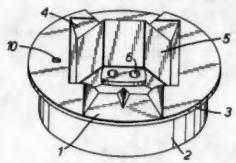
CATSEYE MOUNTINGS

Paul F. Egan, Greensleeves House, Bluebell La., Harescombe, Gloucestershire; William D. Broadfoot, Twin Banks House, Station Rd., Andoversford, Cheltenham, Gloucestershire, and Peter Alden, 57 Portland St., Cheltenham, Gloucestershire, all of England

Filed Dec. 20, 1983, Ser. No. 563,511
Int. Cl.⁴ E01F *9/00*
U.S. Cl. 404—14 **9 Claims**

1. A mounting for a reflective roadstud insert in the form of a rubber pad incorporating reflecting studs, the mounting

comprising a housing defining an internal cavity, mounting projections extending inwardly of the side walls of the cavity to receive and hold the insert within the cavity, the housing



also defining a base part of circular external cross-section, and a circular rim above the base part of larger diameter than the base part, and wherein the circumferential outer wall of the base part tapers outwardly down from below the circular rim.

4,566,821

CONFORMABLE FASCINE

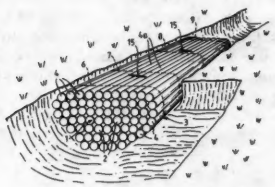
Derek I. Knight, Bournemouth, and Gilbert Sullivan, Highcliffe-on-Sea, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 26, 1984, Ser. No. 674,801

Claims priority, application United Kingdom, Dec. 6, 1983, 8332525

Int. Cl.[4] E01C *9/08*

U.S. Cl. 404—35 **8 Claims**



1. A conformable fascine including a core comprising a multiplicity of tubular core members each capable of elastic cross-sectional deformation when subject to transverse compression forces, and all freely disposed in axially parallel relationship, and a sleeve circumjacent the core comprising a multiplicity of axially parallel tubular sleeve members each of which is capable of elastic cross-sectional deformation when subject to transverse compression forces, all of said sleeve members being transversely and continuously interconnected by at least two axially spaced flexible tie means each disposed as a continuous loop, said sleeve members being conjointly maintained in transverse compression by said tie means.

8. A method of constructing a conformable fascine including the steps of:

a. providing a multiplicity of identical plastics material tubes with diametrical perforations at at least two axially spaced loctions, thereby to comprise sleeve members,

b. arranging the sleeve members side by side on a level surface with their diametral perforations in alignment,

c. threading a length of chain through each aligned set of perforations,

d. securing one protective extremity of one of the chains to a tensioning means operative against the adjacent end sleeve member and applying an open-ended, slotted stop plate to the other protrusive extremity,

e. straining the chain into tension with the tensioning means so as to compress all the sleeve members conjointly,

f. applying a second open-ended slotted stop plate to the chain adjacent the end sleeve member nearest the tensioning means so as to maintain the compression,

g. removing the tensioning means and the excess chain beyond the stop plates,

h. repeating the steps c to g for each chain,

i. bringing the two stopped ends of each chain together and joining them to form a continuous loop, thereby to form the sleeve members into a sleeve,

j. removing the slotted stop plates from each chain, and

k. loosely filling the interior of the sleeve with a multiplicity of core members comprised by plastics material tubes of thinner wall-section that those of the sleeve members.

4,566,822

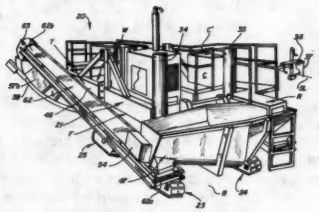
CONSTRUCTION MACHINE

Charles P. Miller, McHenry, Ill., assignor to Miller Formless Co., Inc., McHenry, Ill.

Continuation of Ser. No. 305,204, Sep. 24, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 580,290

Int. Cl.[4] E01C *19/18*

U.S. Cl. 404—84 **21 Claims**



16. An apparatus for placing formable concrete on an elongated base surface, said apparatus comprising: a movable main frame for movement along such a surface in overlying relation thereto; propelling means mounted beneath said main frame and adapted to be supportingly engaged by the base surface as the said frame moves over said base surface; a mule spaced a substantial distance rearward of the rear distal end of said main frame for overlying said base surface and having a hopper with an undersurface conforming substantially to the predetermined configuration of the base surface; support means spaced laterally of said main frame and fixed to said main frame for cantilevered support of said mule in such substantially rearwardly spaced position, and for providing substantial workspace for placement of reinforcing materials on the base surface between said main frame and said mule, said mule subtending said support member; and conveying means carried on said support member for controlled rearward transfer of concrete from said main frame to the hopper of said mule.

4,566,823

CURB EXTRUSION APPARATUS WITH INTERCHANGEABLE MOLDS

George N. May, 9 Francis St., Cardiff, Newcastle, New South Wales, Australia

Filed Nov. 15, 1983, Ser. No. 551,879

Int. Cl.[4] E01C *19/48*; B28B *3/24*

U.S. Cl. 404—98 **14 Claims**

1. A manually maneuverable curb extrusion apparatus for receiving concrete, cement or other building materials and for molding curbs, barrier walls, and gutters from such materials, comprising:

a body frame having a hopper with an open top and an open bottom portion for receiving the concrete, cement or other building material;

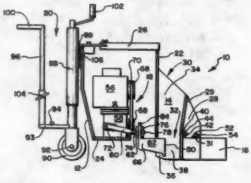
a compacting chamber adjacently subtending the open bottom portion of said hopper and communicating therewith such that the concrete, cement or other building material

falls under the force of gravity from said hopper into said compacting chamber;

at least one extrusion mold having open forward and rearward ends and an open bottom; each said extrusion mold for disposition adjacent to and communicating with said compacting chamber; each said extrusion mold being removable from disposition adjacent said compacting chamber and being interchangeable with another extrusion mold;

means for interchangeably securing, one at a time, said extrusion molds adjacent said compacting chamber;

a power driven feed mechanism operating from a power source comprising at least one reciprocating arm which reciprocates from a first position to a second position, a compacting member, and a connector for attaching said reciprocating arm to said compacting member such that



the power driven reciprocating action of said reciprocating arm is imparted to said compacting member; said compacting member being at least partially disposed within said compacting chamber and engaging concrete, cement or other building material within the compacting chamber in compacting engagement when said reciprocating arm is in its first position and permitting cement or other building material to fall into said compacting chamber when said reciprocation arm is in its second position;

said compacting member further being removable from said connector and being interchangeable with another compacting member, wherein said connector adjustably permits the vertical and lateral disposition of said interchanged compacting member prior to tightening said connector to said interchanged compacting member; and

means for steering said body frame.

4,566,824

SYSTEM FOR DRILLING FROM A WATER SURFACE, WHICH IS INSENSITIVE TO THE SWELL

Jean Minier, Limours; Hervé Barthélemy, La Celle Saint Cloud, and Vincent Foglia, Aulnay sous Bois, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 16, 1983, Ser. No. 552,299

Claims priority, application France, Nov. 19, 1982, 82 19395

Int. Cl.[4] E02B *17/00*; E21B *7/128*

U.S. Cl. 405—202 **6 Claims**

1. A system for drilling from a water surface, of the type having means for exerting a bearing stress on a drilling tool along a direction normal to a sea bed surface to be drilled which is constant during swells, comprising a drilling apparatus including:

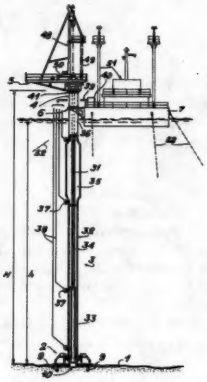
(a) a drill pipe string connected to said drilling tool;

(b) a base having a central bore for passage of said drill pipe string, said base being formed to rest on said sea bed;

(c) a column comprising a cylindrical tubular central guide for guiding said drill pipe string and an external cylindrical tubular envelope surrounding said central guide, said central guide and said envelope forming a hollow annular space which is subdivided into a tight chamber at the foot of said column having a first predetermined length and constituting the lower ballast, a tight intermediate chamber having a length determined as a function of the mean depth of water at a drilling site, a tight chamber having a second predetermined length and constituting an upper ballast, and a head chamber at the head of said column, the total length of said column being greater than the maximum depth of water at said drilling site;

(d) a platform for installation and operation of said drilling apparatus, said platform being supported on said head of said column;

(e) elastic coupling means arranged between said column and said base, with said base having reception means formed therein for receiving said elastic coupling means; and wherein



(f) an adjacent, but separate barge, from said drilling apparatus having anchor lines also independent of said drilling apparatus, for mooring at said drilling site and having an annular collar for receiving the head of said drilling apparatus column, said annular collar and said head having a clearance therebetween for enabling axial sliding and tilting of said head with respect to the vertical direction of said head member.

4,566,825

METHOD OF HARDENING SOFT GROUND

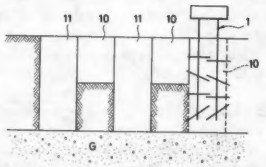
Yoshihisa Hirai, Kokubunji; Masanori Shima, Murayama, and Hirohiko Aoki, Tokyo, all of Japan, assignors to Toa Harbor Works Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,032

Claims priority, application Japan, Mar. 21, 1984, 59-52271

Int. Cl.[4] E02D *3/12, 5/18*; E01C *7/36*

U.S. Cl. 405—267 **6 Claims**



1. A method of hardening a soft ground, comprising the following steps (a) to (f), these steps being performed in sequential order:

(a) introducing a slurry of a cement-based hardener in water under pressure into a soft ground by a ground improvement machine and mixing the slurry with soft soil to form a deep pile,

(b) repeating the above step (a) to form a plurality of deep piles in a manner such that every adjacent pile is joined

together, whereby a deep wall is formed by the plurality of deep piles,

(c) repeating the above steps (a) and (b) to form a plurality of deep walls spaced from one another,

(d) introducing the slurry under pressure into soft ground between two adjacent deep walls and mixing the slurry with soft soil to form a short pile joined to said two adjacent deep walls,

(e) repeating the above step (d) to form a plurality of short piles joined to one another and to said two adjacent deep walls, so that a short wall, joined to said two adjacent deep walls, is formed by the plurality of short piles, and

(f) repeating the above steps (d) and (e) to form a plurality of short walls each joined to two adjacent deep walls.

4,566,826

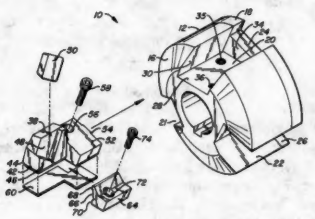
ADJUSTABLE INSERT SUPPORT

Lawrence C. Dickinson, 2255 Eva Adams, Reno, Nev. 89504

Filed Feb. 17, 1984, Ser. No. 581,390

Int. Cl.[4] B23P *15/34*

U.S. Cl. 407—37 **8 Claims**



1. Apparatus for supporting a cutting insert comprising:

a cylindrical head having an axial and a radial direction and including at least one peripheral slot having a generally flat bottom and a pair of sides which are parallel to one another and tilted relative to the bottom when viewed axially so that the bottom of the slot forms an acute corner with one side and an obtuse corner with the other side;

an insert seat having a bottom and a back side which meet at an acute angle conformed to the acute corner of the slot, said seat further having a front side with a recess in a generally radial posture, whereby the recess may receive the cutting insert;

means for securing the seat in the slot with the back side of the seat flush with the side of the slot forming the acute corner with the location of the bottom of the seat relative to the bottom of the slot being adjustable;

a wedge insertable between the insert and the side of the slot forming the obtuse corner; and

means for forcing the wedge radially inwardly to confine the insert between the wedge and the seat.

4,566,827

BALLNOSE END MILL AND INSERT THEREFOR

Ronald L. Neumueller, Rockford, Ill., assignor to Ingersoll Cutting Tool Company, Rockford, Ill.

Continuation of Ser. No. 676,685, Nov. 30, 1984, abandoned, which is a continuation of Ser. No. 428,286, Feb. 22, 1983, abandoned. This application May 24, 1985, Ser. No. 737,576

Int. Cl.[4] B23C *5/02*

U.S. Cl. 407—42 **2 Claims**

2. A ballnose end mill comprising

a tool holder in the form of a generally cylindrical shank having at its cutting end at least two chip gullets each followed by an on-edge cutting insert seated and secured in a recess formed in the shank,

each of said inserts having a first major face which is cylindrically convex,

an opposite major face which is plane, rhomboidal in outline, with its opposite major edges in chordal relation to said cylindrical major face, and upon which the insert is adapted to be seated in a recess in said shank,

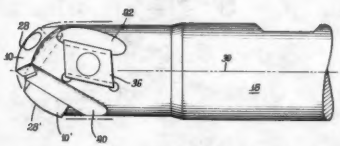
a first pair of opposed, plane, minor boundary surfaces which intersect said plane rhomboidal face on said two major edges and diverge therefrom at equal angles to intersect said convex major face at an acute included angle to form therewith two substantially circular cutting edges on said boundary faces,

a second pair of opposed, plane, minor boundary surfaces which intersect said plane rhomobidal face perpendicularly on its two minor edges, and

a central bore extending between the major faces to receive a securing fastener,

said first and second pairs of minor boundary surfaces, by their acute-angle intersection, forming edges which intersect each of said substantially circular cutting edges in a point,

said inserts each being positioned with one of said first pair



of plane boundary faces disposed as rake faces facing in the direction of rotation of the tool holder and with their respective said cutting edges disposed to sweep portions of a cutting path which is a substantially circular quadrant in projection to a radial plane through the axis of the shank and is continuous from the axis of the shank to the maximum radius of said path measured from said axis,

said one rake face of one of said inserts being positioned substantially radially of the shank with its associated point located at the axis of the shank as a centering point and with the cutting edge associated with said point extending from said point along a major portion of said quadrant,

said one rake face of the other of said inserts being positioned with negative radial rake and positive axial rake and with the cutting edge thereof extending along a major portion of said quadrant from said maximum radius toward said centering point,

the said one rake faces of said inserts being disposed on opposite sides of said axis, and

the cutting paths of said inserts positioned as aforesaid overlapping at the mid-portion of said quadrant by a major portion of the length of each thereby to apportion the heavier cutting load between the inserts.

4,566,828

BALL TRACK MILLING CUTTER TOOL

Josef Reinauer, Sigmaringen, Fed. Rep. of Germany, assignor to Gottlieb Guhring, Ebingen, Fed. Rep. of Germany

Filed Dec. 13, 1983, Ser. No. 560,828

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247138

Int. Cl.[4] B23C *5/22*

U.S. Cl. 407—48 **31 Claims**

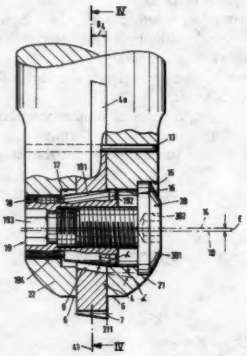
1. A cutting tool for milling grooves of semicircular cross-section comprising:

a holder having at one end a slot forming cooperative first and second clamping jaws, an indexable cutting disc clamped between the first and second jaws, the cutting disc having cutting edges and adjacent flank faces and the slot having abutment surfaces for supporting the cutting

disc within the slot such that the flank faces of the cutting disc abut against the abutment surfaces in the slot;

an opening in the holder passing through the first and second clamping jaws and an opening in the cutting disc having an inner conic surface; the opening of the first jaw being smaller than the opening of the second jaw and the opening of the first jaw having an internal thread;

a positioning nut extending into and through the second jaw opening and protruding through the disc opening and having a thread at one end thereof engaging with the



internal thread of the first jaw opening, the positioning nut having an outer surface forming a sloping conic surface entirely in contact engagement with the inner conic surface of the disc opening, the conic surfaces of the disc opening and the nut being complementary; the positioning nut having an internal thread at another end thereof;

a clamping screw extending into the second jaw opening and into the disc opening, the screw having a threaded portion which engages with the internal thread of the positioning nut to tighten the first and second jaws on the cutting disc and urge the disc against the slot abutment surfaces.

4,566,829

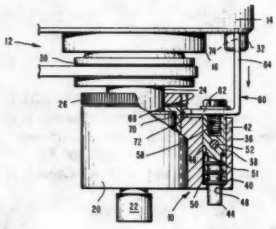
TAPPING ATTACHMENT AND INDEXING MECHANISM THEREFOR

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Filed Feb. 4, 1985, Ser. No. 697,666

Int. Cl.[4] B23B *31/10*; B23G *1/00, 5/14*

U.S. Cl. 408—239 R **11 Claims**



9. A tapping attachment of the type used in conjunction with the machining center having a base which is a source of rotational drive, comprising:

a first housing having a dovetail mortise on the outer surface thereof;

an input shaft means for receiving rotational drive from the machining center, said input shaft being received within said first housing for rotation therein;

a collar having a recess therein secured to said input shaft for rotation therewith;

an output shaft mechanically connectable to said input shaft for transmitting rotational drive to a tool to do work upon a workpiece;

a second housing having an elongated dovetail tenon, on the outer surface thereof, said tenon being slidably positioned in said mortise of said first housing to form a compact and rugged assembly;

a spring biased plunger received within said second housing for constrained limited movement therein;

an "L" shaped bracket having radially and axially extending arms, said bracket being secured to said plunger for movement therewith, said radially extending arm having a stop engagable with, the recess of said collar to prevent rotation thereof to non-rotatably lock said input shaft in a predetermined angular orientation when said bracket is in a first position, and movable to a second position of disengagement with said collar; said axially extending arm engagable with the base of the machine to move said stop to said second position and prevent rotation of said housings and to permit movement of said stop to said first position when said axially extending arm is not engaged with the base of the machine.

4,566,830

ROUTER WITH QUICK DEPTH OF CUT ADJUSTMENT

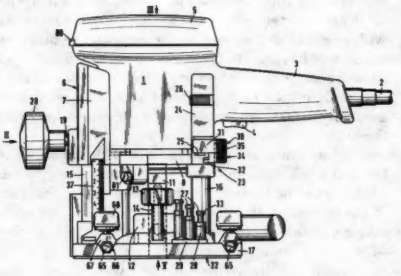
Peter Maier, Gerokstrasse 1, 7311 Neidlingen; Karl Attinger, Seestrasse 21, 7311 Holzmaden; Albert Sigel, Scholderplatz 21, 7315 Weilheim; Gernot Hänsel, Gerstenstrasse 31, 7000 Stuttgart 70; Erwin Kutscher, Hohenstaufenstr. 24, 7333 Ebersbach-Bünzwangen, and Hartmut Walter, Im Saemann 71, 7050 Waiblingen, all of Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,634

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314419

Int. Cl.[4] B23C *1/12*

U.S. Cl. 409—182 **6 Claims**



1. A router with depths of cut adjustment comprising:

a drive unit (**1**);

a drive unit cage (**6**) for carrying said drive unit;

a cutter shaft (**1**) connected to and rotatable by said drive unit, said cutter shaft having an end for receiving a cutter;

guide column means (**15,16**) extending out of said cage in the same direction as said cutter shaft;

a rest plate (**17**) guided on said guide column means for movement toward and away from said cage and having an aperture therethrough for the passage of a cutter connected to said cutter shaft to a selected depth beyond a bottom of said rest plate;

a threaded spindle guide (**24**) connected to said cage and having opposite open ends;

a hollow threaded spindle (**25**) threadably engaged in said

spindle guide, said spindle having one open end spaced away from said rest plate and an opposite end facing said rest plate, said splindle being rotatable in said guide for movement toward and away from said rest plate;

a movable plate (29) movably connected to said rest plate;

a plurality of threaded stop pins (27) threaded to said movable plate and each having a head portion (33), said stop pins being rotatable for movement of their head portions toward and away from said cage, said movable plate being movable to bring each of said stop pins separately into alignment with said hollow spindle;

a swing extension (30) swingably connected to said opposite end of said hollow spindle for movement into engagement with and under a head portion of a stop pin which is in alignment with said hollow spindle and which is brought into engagement with said hollow spindle for mechanically holding said stop pin to said hollow spindle, a top of said head portion being accessible through said one open end of said hollow spindle and through one of said open ends of said guide for rotation of said stop pin, said hollow spindle being rotatable in said spindle guide for adjusting a distance between said cage and said rest plate.

4,566,831

SHOCK ABSORBENT DUNNAGE DEVICE

John P. Groth, Stillwater, Minn., assignor to Andersen Corporation, Bayport, Minn.

Filed Feb. 1, 1980, Ser. No. 117,782

Int. Cl.⁴ B60P *7/14*

U.S. Cl. 410—117 **8 Claims**

1. An improved dunnage bag device for filling void areas between articles being packed for shipment comprising:

(a) an outer sealed envelope of thin flexible material, defining an internal cavity; and

(b) particulate shock absorption filler material comprising wooden by-products such as sawdust or wood shavings loosely packed within and filling at least 70 percent of said internal cavity, said filler material having a moisture content of less than or equal to 20 percent; wherein said bag is resiliently responsive to impact forces applied thereto regardless of extended exposure of the bag to freezing temperatures.

4,566,832

SLEEVE-SHAPED EXPANSION DOWEL

Helmut Mirsberger, Munich, and Franz Popp, Puchheim, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

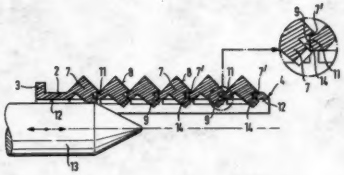
Filed Nov. 8, 1983, Ser. No. 550,239

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241596

Int. Cl.⁴ F16B *13/04*

U.S. Cl. 411—21 **5 Claims**

1. A sleeve-shaped expansion dowel comprising an axially extending sleeve defining an axially extending borehole and said sleeve having a first end and a second end spaced apart in the axial direction, expansion tongues formed in and articulated to said sleeve and said tongues being pivotably displaceable from an unexpanded position relative to said sleeve radially outwardly from said sleeve into an expanded position by axially displacing an expanding member through the borehole in said sleeve, said tongues arranged in a row one immediately following the other in the axial direction of said sleeve, each said tongue having a first end and a second end spaced apart in the axial direction of said sleeve and the first end being free for radially outwardly displacement from said sleeve into the expanded position and the second end being closely adjacent to the first end of the next said tongue in said row, said tongues



having an inside surface adjacent the second ends thereof in general alignment with the surface of the borehole in the sleeve and adjacent the first ends thereof having a projection extending radially inwardly from the inside surface into the borehole in said sleeve in the unexpanded position of said tongues, said expansion tongues are articulated to said sleeve at the second ends thereof and are pivotally displaceable about pivot axes extending normal of the axis of said sleeve, and said end of each said expansion tongue comprises a web connection said expansion tongue laterally thereof to said sleeve.

4,566,833

DEVICE TO BUNDLE ROLLED BARS OR ROLLED SECTIONS

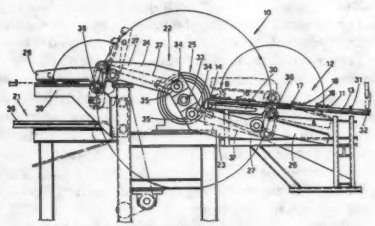
Sergio Gigante, Udine, Italy, assignor to Danieli & C. Officine Meccaniche S.p.A., Buttrio, Italy

Continuation of Ser. No. 508,195, Jun. 27, 1983, abandoned. This application May 1, 1985, Ser. No. 728,455

Claims priority, application Italy, Jul. 9, 1982, 83420 A/82

Int. Cl.⁴ B65G *57/04, 57/18*

U.S. Cl. 414—30 **5 Claims**



1. A device to bundle rolled bars which are advantageously flanged and channel sections coming from a delivery line, comprising a conveyor, retractable separating and sorting stops cooperating with said conveyor and transfer means able to take the bars from the conveyor and to place them in successive layers on suitable gathering and discharge means, said transfer means comprising a central shaft, a unidirectional rotatable symmetrical two-armed lever keyed to and supported on said central shaft, a swinging magnetic head having ends pivoted at one of its ends on an end of each of said arms around a horizontal axis substantially crosswise to said arm, said magnetic head rotatable multidirectionally and positionable so as to

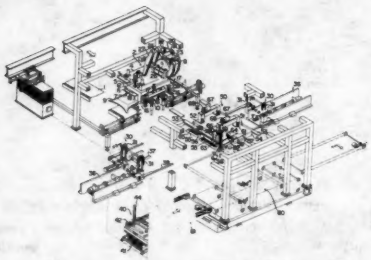
move towards and prolong the lengthwise axis of the relative arm when it is taking, carrying and laying down the bars.

4,566,834

AUTOMATIC PALLETIZING SYSTEM

Kiyokazu Baba; Shojiro Shirao, both of Komatsu; Kenji Nishida, Matsuto, and Hiroshi Kiyosawa, Komatsu all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,764
Claims priority, application Japan, Feb. 15, 1983, 58-22090
Int. Cl.[4] B65H *31/32*
U.S. Cl. 414—27 **1 Claim**



1. An apparatus for palletizing panels and like flat articles fabricated by a press, comprising:

conveyor means for discharging the panels from the press;

unloading means for unloading the panels from said conveyor means, said unloading means comprising a first carrier mounted above said conveyor means, said first carrier being horizontally reciprocable between a first position have above the discharging end of said conveyor means where unloading of the panels starts and a second position where unloading of the panels is completed, a second carrier mounted below said first carrier and movable up and down relative to said first carrier, and a turning arm mounted to the underside of said second carrier for pivotal movement in a vertical direction, said turning arm panel engaging means mounted thereto;

a pair of latch conveyor means provided on opposite sides of said unloading means at a position corresponding to said second position of said unloading means, said pair of latch conveyor means being adapted to move towards and away from each other and to receive and hold a plurality of panels with spacings between the panels when moved towards each other, each of said latch conveyor means comprising a pair of latch conveyors each including a pair of sprockets, a chain wound around said sprockets, a plurality of latches each movable between a projected position for supporting a panel and a retracted position, means for normally urging said latches to said retracted position, and means for knocking out each of said latches to said projected position;

first pallet means provided below said latch conveyor means for receiving the panels therefrom, said first pallet means comprising two pairs of pallet hook means each comprising a pallet hook member and a plurality of hooks mounted to said pallet hook member, each of said hooks being adapted to support respective panels transferred from said latch conveyor means;

means for lifting and lowering said first pallet means;

hanger means for receiving panels each having an opening formed therein from said turning arm after the panels are oriented vertically by a right angular pivoting of said turning arm from a horizontal position, said hanger means comprising a main hanger and a sub-hanger, both hangers being adapted to move up and down and back and forth and each comprising a pair of L-shaped members and a connection member for coupling said L-shaped members in a spaced relation, each L-shaped member having a chain mounted therein; and

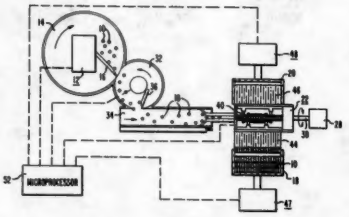
second pallet means for receiving the panels with openings from said hanger means.

4,566,835

NUCLEAR FUEL PELLET SINTERING BOAT LOADING SYSTEM

Theodore E. Raymond, Swansea; Thomas B. Huggins, Columbia, and George E. Vining, West Columbia, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1983, Ser. No. 536,934
Int. Cl.[4] B65G *57/08, 57/10*
U.S. Cl. 414—53 **10 Claims**



1. A system for loading nuclear fuel pellets into a first sintering boat from a pellet press which ejects newly-made said pellets, said system comprising:

(a) a generally horizontally disposed rotatable drum having two ends and having therebetween at least one generally circumferentially disposed and longitudinally aligned channel for holding a row of said ejected pellets, with said channel having an open end at one end of said drum;

(b) means for rotating said drum to rotate said channel from a generally upward vertical position to a first generally below-horizontal position and around to said upward vertical position;

(c) means for receiving said pellets ejected from said press, and for inserting said row of said ejected pellets into said channel from its said open end when said channel is disposed at its said upward vertical position;

(d) means for pushing said row of said held pellets radially outward from said channel to discharge them therefrom when said channel is disposed at its said first below-horizontal position;

(e) a first incline disposed with its upper end generally adjacent said channel, when said channel is disposed at its said first below-horizontal position, to slidingly receive said first position discharged pellets;

(f) means for relatively positioning said first sintering boat and the lower end of said first incline such that said first incline sliding pellets leave said first incline generally adjacent the position in said first sintering boat of the predetermined next-to-be-stacked said row of said pellets to be loaded into said first sintering boat; and

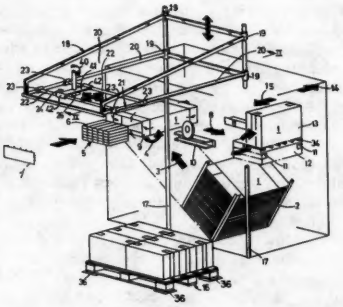
(g) means for controlling said pellet receiving and inserting means, said drum rotating means, said relative positioning means, and said pellet pushing means.

4,566,836

APPARATUS FOR HANDLING PACKED GOODS

Maurice Berger, Cortaillod; Jean-Francois Bernasconi, Collombier, and Michel R. Juillerat, Neuchatel, all of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Continuation of Ser. No. 477,295, Mar. 21, 1983, abandoned.
This application Jun. 12, 1985, Ser. No. 743,888
Claims priority, application European Pat. Off., Mar. 31, 1982, 82810144.4
Int. Cl.[4] B65G *57/04, 57/22*
U.S. Cl. 414—57 10 Claims



1. Apparatus for handling a plurality of packages, said apparatus comprising:

gripping means for individually gripping one of said plurality of packages situated in a presentation position;

support means for supporting said gripping means, said support means including:

fixed upright means,

a bridge adapted for vertical movement on said upright means,

a movable rig adapted for movement on said bridge in a longitudinal direction, and

a carriage adapted for movement on said movable rig in a transverse direction;

a free space between said bridge and a floor level under said bridge;

drive means for driving said carriage, said movable rig, and said bridge;

presentation means adapted for supporting a single one of said packages and for bringing said supported package from a checking position situated not under said bridge into a presentation position situated within said free space, said presentation means including a roller train movable at a first speed to convey said package being supported thereby at a second speed to said presentation position, said second speed being greater than said first speed; and

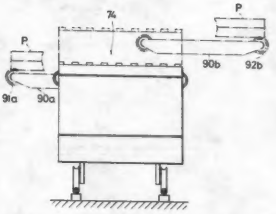
control means for controlling said gripping means, said drive means, and said presentation means to successively grip packages situated in said presentation position, drive said gripping means, and dispose said packages in successive layers according to a predetermined arrangement on a pallet located at a loading location on said foor in said free space.

4,566,837

AUTOMATIC WORK EXCHANGING APPARATUS

Tadataka Shiomi; Kouichi Nabika, both of Gifu, and Takashi Kawagoe, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Continuation of Ser. No. 380,764, May 21, 1982, abandoned.
This application Oct. 12, 1984, Ser. No. 660,542
Claims priority, application Japan, May 24, 1981, 56-79006
Int. Cl.[4] B25Q *7/02*
U.S. Cl. 414—222 1 Claim



1. An automatic work exchanging apparatus for transferring palletized workpieces between a transport truck, automatically conveying a palletized workpiece from a remote location to a position in front of a selectable one of a plurality of machine tools, and said machine tool, comprising:

a transfer truck laterally displacable along a set of rails in front of the machine tool, said transfer truck being positioned between and adjacent to said machine tool and said transport truck in response to an external command;

a generally rectangular platform vertically movable along supports positioned at the four corners and at the center of each of the longer sides of said platform, said rectangle being so oriented as to have the longer sides parallel with the direction of displacement of the transfer truck;

a pair of pistons, vertically disposed between said transfer truck and said platform, cooperatively operable to cause said vertical motion of said platform so as to maintain said platform in a substantially horizontal orientation; and

at least one pallet displacing device, positioned on and affixed to said platform;

wherein each said pallet displacing device further comprises:

a slidable member;

guide rails disposed on the platform for guiding said slidable member;

guide rollers supporting the slidable member enabling said slidable member to be moved in a direction perpendicular to the extent of the rails on which the transfer truck travels;

two pinions, one supported at each end of the slidable member, each of said pinions being capable of engaging a rack on a pallet carrying said workpiece;

switch means for detecting the position of the slidable member; and

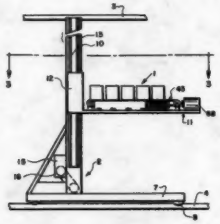
a driving device for operating the slidable member, said driving device having a second rack provided on a lower face of the slidable member and a third pinion driven by a motor mounted on the platform, said third pinion being engaged with the second rack, said one of the two pinions supported on said slidable member closer the transport truck being driven by a motor on the slidable member through sprockets and a first chain, and the other of the two pinions, supported on said slidable member closer to the machine tool, being driven by a second chain provided between a further sprocket coaxial with the former pinion and another sprocket so that said pinions are rotated in a same direction with an identical speed.

4,566,838

ACCUMULATOR PAN TRANSFER DEVICE

Ronald L. Binning, St. Petersburg, and Burton C. Sieder, Clearwater, both of Fla., assignors to Intech Systems, Inc., Hampton, Va.

Filed Aug. 10, 1983, Ser. No. 521,947
Int. Cl.[4] B65G *1/04*
U.S. Cl. 414—278 **20 Claims**



1. An improved pan transfer system for a warehouse of the type having a shuttle movable along an aisle adjacent a storage rack having a plurality of storage compartments formed therein, said system including:

(a) pan means for containing stored articles adapted to be removably located in one of the storage compartments;

(b) a base vertically movably mounted on the shuttle;

(c) accumulated belt means mounted on the base for movement in a horizontal plane for transferring and accumulating a plurality of the pan means on said base;

(d) extractor means movably mounted on the base by wheels for individually transferring pan means between a storage compartment and the accumulator belt means; and

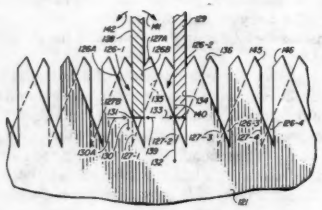
(e) drive means for moving the extractor means toward and away from a storage compartment, said drive means including guide tracks having V-shaped configurations mounted on the base and reversible motor means for moving the extractor means along the guide tracks toward and away from the storage compartment by the wheels which move in said guide tracks.

4,566,839

SEMICONDUCTOR WAFER DIFFUSION BOAT AND METHOD

Robert M. Butler, Tempe, Ariz., assignor to Microglass, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 495,642, May 18, 1983. This application Oct. 24, 1983, Ser. No. 544,588
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—404 **11 Claims**



1. A boat for carrying thin semiconductor wafers, said boat comprising ih combination:

(a) first and second spaced, parallel rails, each having a longitudinal axis;

(b) means for rigidly connecting said first and second rails together in fixed relationship to each other;

(c) a first group of generally parallel wafer supporting grooves disposed in uniformly spaced relationship in an upper surface of said first rail, said wafer supporting grooves of said first group being generally perpendicular to said longitudinal axis of said first rail; and

(d) a second group of generally parallel wafer supporting grooves disposed in uniformly spaced relationship in an upper surface of said second rail, said wafer supporting grooves of said second group being generally perpendicular to said longitudinal axis of said second rail, each wafer supporting groove of said first group being aligned with a corresponding wafer supporting groove of said second group to cooperate therewith in engaging lower edge portions of a semiconductor wafer to support that semiconductor wafer,

wherein, a first wafer supporting groove of said first group includes a first flat, vertical groove wall surface for engaging a first peripheral portion of a first face of a first semiconductor wafer and a first steeply inclined groove wall surface opposed to said first flat vertical groove wall surface for supporting an edge point of a second face of said first wafer and exerting a horizontal force on said first semiconductor wafer, due to the weight of said first semiconductor wafer, to urge said first peripheral portion of said first face tightly against said first flat, vertical groove wall surface of said first wafer supporting groove of said first group, and

wherein a first wafer supporting groove of said second group includes a second flat, vertical groove wall surface for engaging a second peripheral portion of said second face of said first semiconductor wafer and a second steeply inclined groove wall surface opposed to said second flat, vertical groove wall surface for supporting an edge point of said first face of said first semiconductor wafer and exerting a horizontal force on said first semiconductor wafer, due to the weight of said first wafer, to urge said second peripheral portion of said second face tightly against said second flat, vertical groove wall surface of said first wafer supporting groove of said second group, whereby said first wafer is held firmly in a precisely vertical position by said first wafer supporting grooves of said first and second groups, respectively.

4,566,840

MECHANISM FOR DUMPING A CONTAINER INTO A REFUSE COLLECTION VEHICLE

Fred T. Smith, Palos Verdes Pennisula, Calif., assignor to The Heil Co., Milwaukee, Wis.

Continuation of Ser. No. 368,529, Apr. 15, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,670
Int. Cl.[4] B65F *3/04*
U.S. Cl. 414—408 **14 Claims**

5. A mechanism mounted on a refuse collection vehicle for lifting a container from a standing position at one side of the vehicle to an inverted position over the vehicle for dumping the contents of the container into the vehicle:

(a) a support frame assembly means (**18**), said support frame assembly means including a substantially vertically extending leg (**30**) and a substantially horizontal leg (**32, 34**) extending from the upper end of said vertical leg;

(b) a lift arm (**20**) supported from said horizontal leg of said support frame assembly means;

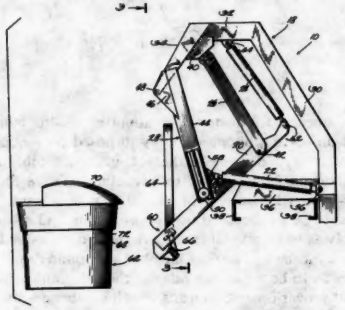
(c) support means (**26**) for supporting said lift arm from said horizontal leg of said frame assembly means, said support means including a link member pivotally connected at its upper end to said horizontal leg of said frame assembly and pivotally connected at its lower end to said lift arm at a point intermediate the ends of said lift arm;

(d) a container gripping means (**60**) mounted on one end of said lift arm, said container gripping means adapted to

move between a container gripping position and a container release position;

(e) a guide means (28) supported from said horizontal leg of said frame assembly and adapted to engage and guide the movement of said lift arm as said lift arm is moved between a position for gripping a container when in a standing position and a position wherein the container is inverted for dumping its contents, said guide means including a track member pivotally connected at its upper end to said horizontal leg of said frame assembly and adapted for engagement with a roller member mounted on said lift arm, said roller member mounted on said lift arm at a point intermediate the ends thereof;

(f) a power cylinder means (24) supported on said frame assembly and operatively connected to said lift arm, said



power cylinder means adapted to move said lift arm between a position for gripping a container when in an upright standing position to a second position in which the container assumes an inverted position for dumping the contents thereof, said power cylinder means being effective upon energization thereof to move the container from an upright standing position to an inverted dumping position; and

(g) a power track cylinder (22) pivotally connected at one end to said vertical leg of said support frame assembly and pivotally connected at its other end to said track member of said guide means, said power track cylinder adapted to move said lift arm so that the end thereof on which said gripping means is mounted will move in a direction substantially horizontal to the surface upon which the container is standing.

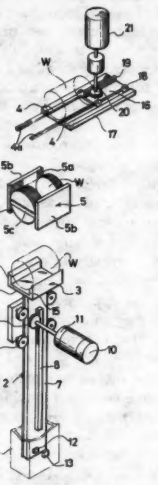
4,566,841

WAFERY WORKS RECEIVING OR DELIVERING DEVICE

Kenji Ohmura; Tsutomu Miyata; Yoshihiro Yamashita, and Minoru Noda, all of 31-1, Kameido 6-chome, Koto-Ku, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,293
Claims priority, application Japan, Dec. 1, 1982, 57-210974
Int. Cl.⁴ B65G *65/34*
U.S. Cl. 414—417 **5 Claims**

1. Wafery works receiving or delivering device comprising: a work supporting means having plural pairs of opposed supporting grooves of a given pitch dimensioned to support a column of wafery works in erect positions; a transfer mechanism having said work supporting means mounted at the upper end thereof and reciprocable between a standby position and a work receiving or delivering position; a pair of forks located in the region of said work receiving or delivering position and having supporting grooves of the same pitch as that of the supporting grooves of said work supporting means; a fork advancing mechanism for advancing said forks to said work receiving or delivering position to enable said forks to overlap said work supporting means such that the supporting grooves of said forks align with those of said work supporting means; and means for collectively transferring the works supported in erect positions on said work supporting means to said forks or for collectively transferring the works supported in erect positions on said forks to said work supporting means in response



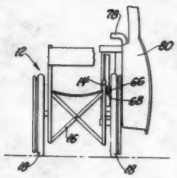
to movement of said work supporting means into and out of said work receiving or delivering position.

4,566,842

WHEELCHAIR DOCKAGE AND STORAGE SYSTEM

Robert A. Clarke, Madison Heights, Mich., assignor to Autodynamics Corporation of America, Madison Heights, Mich.

Filed Apr. 30, 1984, Ser. No. 605,302
Int. Cl.⁴ B60R *11/00*
U.S. Cl. 414—462 **20 Claims**



11. A wheelchair docking and storage assembly for collapsing and storing a wheelchair having a frame which folds as the frame is raised relative to the wheels thereof, said assembly comprising:

lifting means for engaging the frame of the wheelchair and lifting the wheelchair;

stop means for engaging a wheel of the wheelchair whereby said lifting means raises the wheelchair relative to the wheel thereof which engages said stop means to collapse the wheelchair;

said lifting means including arm means for engaging the wheelchair, raising means for selectively and reversibly raising said arm means, and drive means operatively connected to said raising means for driving said raising means;

said assembly being adapted to be mounted on a support wall;

said raising means including a screw member having an outer threaded surface operatively connected to said drive means to be selectively driven in a clockwise or counter clockwise direction, follower means fixedly connected to said arm means and threadably connected to said screw member so as to travel along said screw member as it is driven by said drive means, and guide means for guiding said follower means to turn relative to said screw member

and move said arm means against the support wall as said follower means is raised along said screw member and to move said arm means away from the support wall as said follower means is lowered along said screw member;

said follower means including at least one follower member having a threaded bore therethrough threadably engaging said screw member, an axle member extending therefrom, and a cam wheel rotatably mounted on said axle member;

said guide means being substantially U shaped in cross section defining an inner channel;

said cam wheel being rotatably mounted within said channel for movement there along;

said channel including a lower portion and an upper portion being twisted axially approximately 25 degrees counter clockwise relative to said lower portion and having a constant cross sectional dimension whereby said arm means is pivoted approximately 25 degrees as said follower member travels from said lower portion of said channel through said upper portion of said channel;

said arm means including an envelope member adapted to be connected to an arm of the wheelchair and having a pocket therein; and

said arm means further including a plate member connected to said follower member and having a predetermined shape for being inserted into said pocket.

4,566,843

MULTIARTICULATED MANIPULATOR

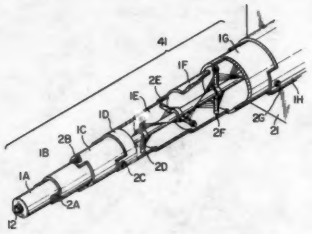
Nobuyoshi Iwatsuka; Fumio Tomizawa; Chikara Sato, all of Hitachi; Norihiko Ozaki, Mito; Yoshiaki Ichikawa, Hitachi, and Kenichiro Sadakane, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,078

Claims priority, application Japan, Sep. 22, 1982, 57-163901

Int. Cl.⁴ B66C *23/00*

U.S. Cl. 414—680 **5 Claims**



1. A multiarticulated manipulator comprising:

a multijoint connecting mechanism including a plurality of arms, each arm having a joint capable of being bent in only one plane about a joint axis and all the arms being connected with one another in positions displaced from one another by a circumferential extent of an arbitrarily selected angle;

a multiplicity of wires each connected to one of the arms for moving the arms in swinging movement about the joint axis of their respective joints;

a plurality of wire guides for supporting and guiding the wires through the arms of said multijoint connecting mechanism to their arms to be moved in swinging movement, each of said wire guides being formed with apertures located on the joint axis of a respective one of the joints for the wires to extend therethrough, so that, when one arm is actuated for swinging movement about its joint axis by driving the wires connected thereto, no mutual interference occurs between the joints during operation whereby the swinging movement of the arm about its joint axis does not cause other arms to move in swinging movement about their joint axes; and

drive unit means for driving each of the wires.

4,566,844

BUCKET FOR MATERIAL

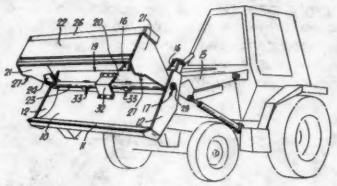
Joseph C. Campin, Le Tertre, Cidex 541bis, Theillay F-41300 Salbris, France

Filed Dec. 12, 1983, Ser. No. 560,363

Claims priority, application United Kingdom, Dec. 21, 1982, 8236292

Int. Cl.⁴ F02F *3/76*

U.S. Cl. 414—726 **7 Claims**



1. A bucket, for material handling apparatus including a bucket-supporting boom assembly disposed on a vehicle and projecting beyond one end thereof which assembly is so attached to the vehicle as to be pivotable relative thereto by power-operated means, said bucket having a back member adapted to be so mounted on the projecting end of the boom assembly as to be pivotable relative thereto by second power-operated means and a front member so mounted on the back member as to be moveable relative thereto about a pivot axis by third power-operated means which comprise a single, central hydraulic piston-and-cylinder assembly connected between a point on the back member and a lug fixed to a torsion bar which is connected only to the ends of the front member on the pivot axis thereof.

4,566,845

MEASURED-FORCE GRIPPER DEVICE OF ARTICULATED STRUCTURE HAVING SEVERAL DEGREES OF FREEDOM

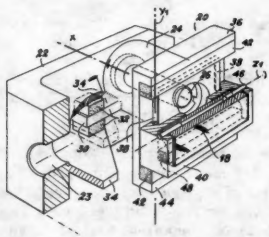
Mayez Al Mouhamed, Talkhalakh, Syria; Etienne Csakvary, Maurepas, France; Bertrand De Cosnac, Paris, France, and Jean-Paul Noel, Chatenay Malabry, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 12, 1983, Ser. No. 457,488

Claims priority, application France, Jan. 28, 1982, 82 01326

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 414—735 **8 Claims**



1. A measured-force gripper device to be attached to the end of a manipulator arm, comprising;

two fingers, each being formed by a support;

a spindle connected to an end portion of the support and having a geometrical axis perpendicular to said end portion;

a bearing mounted to pivot on the spindle;

a flange connected to the bearing;

a table which can make a translational movement in relation

to the flange and a contact plate which is adapted to contact an article to be handled and pivotedly fitted about an axis perpendicular to the geometrical axis of the spindle in relation to said mobile table;

a first displacement-measuring pickup being interposed between said support and said bearing to deliver an information related to the rotational movement of said bearing about the spindle axis;

a second displacement-measuring pickup being interposed between said flange and said mobile table to deliver an information related to the translational movement of said table; and

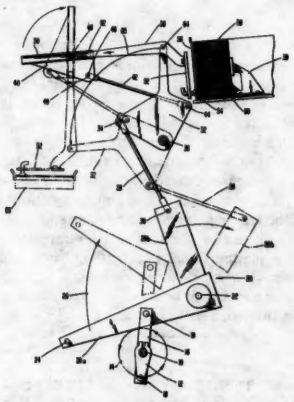
a third displacement-measuring pickup being interposed between said table and said contact-plate to deliver an information related to the rotational movement of said contact plate about its axis.

4,566,846

CARTON TRANSFER APPARATUS WITH EFFECTIVE CONSTANT LENGTH INVERTING ARM

Willard E. Cartwright, Los Altos, Calif., assignor to Kliklok Corporation, Greenwich, Conn.

Filed Dec. 17, 1982, Ser. No. 450,523
Int. Cl.⁴ B23Q 7/04
U.S. Cl. 414—742 **13 Claims**



1. A carton transfer apparatus for transferring carton blanks between pickup and discharge locations by pivotally moving an inverting arm of fixed pivot length with a feed carrier on one end betwen the pickup and discharge locations and about a moving pivotal axis, comprising:

(a) a frame

(b) a drive arm pivotally secured to said frame for rotation about a first axis;

(c) a track pivotally secured to said frame;

(d) an inverting arm having a follower defining a pivotal axis, said inverting arm having a feed carrier at one end, the follower being positioned on said inverting arm and guided by said pivotal track which forms substantially the entire path of travel for said follower so as to control movement of the inverting arm, said inverting arm being pivotally connected to said drive arm and pivotally movable about the follower's pivotal axis in response to rotation of said drive arm about the first axis; and

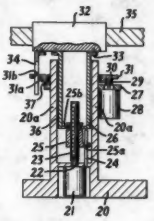
(e) means for rotating said drive arm about said first axis and guidingly moving the follower freely along said track and simultaneously pivoting the inverting arm about the follower's pivotal axis as the feed carrier is moved between the pickup and discharge locations, wherby the inverting arm has an effective fixed pivot length and is pivoted about a moving pivotal axis to avoid imposing acceleration on said inverting arm and maintain control and smooth transfer movement of the carton blanks.

4,566,847

INDUSTRIAL ROBOT

Takashi Maeda, and Masayuki Sato, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,717
Claims priority, application Japan, Mar. 1, 1982, 57-32156
Int. Cl.⁴ B25J 9/00
U.S. Cl. 414—744 R **7 Claims**



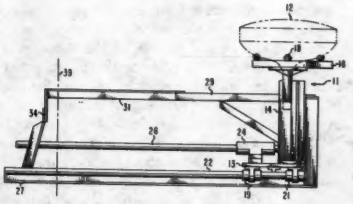
1. A positioning apparatus for use in positioning an arm of an industrial robot in angular and linear positions comprising: a frame member connectable to an arm of an industrial robot during use of the positioning apparatus; a frame-supporting member connected to and supporting the frame member; a base having an upstanding hollow sleeve portion; means mounting the frame-supporting member within the base hollow sleeve portion to undergo linear movement and angular movement, said means including bearing means between an outer peripheral surface portion of the frame-supporting member and an inner peripheral surface portion of the base hollow sleeve portion for slidably mounting the frame-supporting member to undergo linear and angular sliding movements; linear drive means for effecting linear driving movement of the frame-supporting member; and angular drive means for effecting angular driving movement of the frame-supporting member.

4,566,848

DEVICE FOR POSITIONING AND ORIENTING KINESCOPES

Merle E. Hertzler, Berks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1984, Ser. No. 636,257
Int. Cl.⁴ B65G 11/00
U.S. Cl. 414—749 **11 Claims**



1. A device for accurately positioning and orienting a substantially rectangular envelope including a funnel having a neck portion at a preselected position comprising:

a first carriage for receiving said envelopes, said first carriage being vertically fixed and horizontally moveable between a first position and said preselected position;

a second carriage arranged at said preselected position, said

second carriage being horizontally fixed and vertically moveable whereby said second carriage removes said envelopes from said first carriage at said preselected position;

at least two guide members arranged on opposite sides of said first carriage and extending between said first position and said preselected position, at least a portion of said guide members converging toward said preselected position, said guide members being vertically positioned to urge the neck of an envelope carried by said first carriage to a position substantially centered between said guide members;

neck centering members moveably arranged on said second carriage, said neck centering members being configured to engage the neck of said envelope to center said neck at said preselected position and to vertically align the longitudinal axis of said neck; and

envelope orienting means arranged about said preselected position for engaging the sides of an envelope carried by one of said carriages to orient said envelope in a preselected orientation at said preselected position.

4,566,849

PRESSURE MEDIUM DRIVEN MACHINE TOOL

Claes H. Flink, Åmål, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

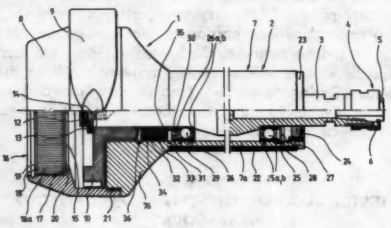
PCT No. PCT/EP83/00067, § 371 Date Oct. 21, 1983, § 102(e) Date Oct. 21, 1983, PCT Pub. No. WO83/03119, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 8, 1983, Ser. No. 557,284

Claims priority, application Sweden, Mar. 8, 1982, 8201404

Int. Cl.⁴ F01D *15/16;* **B23Q** *5/06;* **B24B** *47/14*

U.S. Cl. 415—92 **11 Claims**



1. In a machine tool having a jet turbine driving a rotatable spindle with a tool holder, said spindle being rotatably supported in a spindle housing, said jet turbine having a disc-shaped turbine rotor closely rotatably enclosed by a turbine housing, said turbine rotor having peripherally arranged discrete recesses, each recess having a concave front actuation wall for the jet and one sidewardly arranged outlet opening which opens in the axial direction of the rotor, said housing having at least one inlet nozzle for the jet directed into the recesses and having at least one outlet opening for the spent jet medium, comprising the improvement wherein: the inlet nozzle is directed circumferentially of and tangentially to the rotor towards the deepest section of the concave front actuation wall; each recess is provided with a concave side wall opposite to the outlet opening and is also provided with a concave rear wall opposite to the front actuation wall; each recess is provided with a flat bottom wall surrounded by the front acutation wall, the side wall and the rear wall which are interconnected with each other; the turbine housing has an unrestricted exhaust opening disposed axially adjacent one end of the rotor in direct communication with the outlet opening; and the bottom wall is inclined backwardly relative to the flow direction of the jet when the jet initially impacts against the front wall so that said side, rear and bottom walls define an expansion space below the jet which is of increasing depth towards the rear wall and also define a guiding path towards the outlet opening for the expanding jet medium.

4,566,850

PUMP

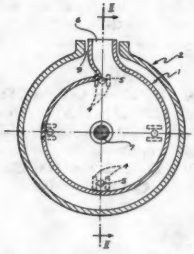
Anthony Grzina, Artarmon, Australia, assignor to Warman International Limited, Australia

Continuation of Ser. No. 184,075, Sep. 4, 1980, abandoned. This application May 2, 1984, Ser. No. 606,271

Claims priority, application Australia, Sep. 7, 1979, PE0412

Int. Cl.⁴ F04D *7/06;* **F01D** *25/26*

U.S. Cl. 415—128 **12 Claims**



1. A pump comprising an outer casing, an inner liner, a rotatable impeller mounted on a central shaft and means for affixing the liner within the casing to substantially secure the liner against rotational movement within said casing while providing clearance for the liner to expand, contract and deflect radially from the centreline of rotation of the impeller;

said affixing means comprising at least three sets of two radially aligned, axially extending projections located on one of the facing surfaces of the liner and the casing adjacent the ingress of the shaft of the impeller with corresponding mating, axially extending projections on the other of said facing surfaces, each mating projection being adapted to slidably fit between a corresponding set of two radially aligned, axially extending projections.

4,566,851

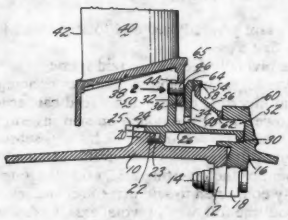
FIRST STAGE TURBINE VANE SUPPORT STRUCTURE

Roger J. Comeau, Ware, Mass., and Walter J. Baran, Jr., So. Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 11, 1984, Ser. No. 609,911

Int. Cl.⁴ F01D *25/24*

U.S. Cl. 415—139 **7 Claims**



1. A vane assembly for a turbine including:

a surrounding case having a mounting flange on its outer surface and a spacer flange on its inner surface spaced forwardly, axially from, the mounting flange,

a sleeve positioned within said case and supported radially and axially by said spacer flange adjacent its forward end,

spaced flanges on the inner surface of the sleeve, one of said flanges having radial slots in its inner periphery,

a turbine case secured to the mounting flange and engaging the rearward end of the sleeve to hold it in axial position only, and

a row of turbine vanes positioned within the sleeve, each vane having an outer shroud and a lug extending outwardly from said shroud, said lug being positioned between said spaced flanges in the sleeve, some of said lugs having axially extending torque pins thereon to engage in said slots, said flanges on the sleeve are upstream from one another and in which the upstream flange has the slots therein and the flange downstream thereof has cooling air passages closely spaced from the sleeve, and in which some of the slots are elongated to permit circumferential movement of the vanes for assembly, and said flange downstream of the lugs has a lateral flange at its inner end and an inner modular seal supported by said lateral flange.

4,566,852

AXIAL FAN ARRANGEMENT

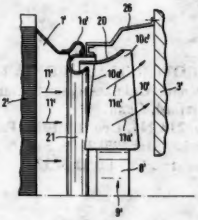
Kurt Hauser, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 14, 1983, Ser. No. 475,038

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 8207204[U]; Sep. 10, 1982, 3233622

Int. Cl.⁴ F01D *9/04*; F04D *29/54*

U.S. Cl. 415—182 **12 Claims**



11. An axial fan arrangement especially for the cooler or radiator of a water cooled internal combustion engine for vehicles and the like, comprising:

a rotatable fan hub,

fan blades carried by the hub,

and air guide structure surrounding the blades, which expands or widens toward the air exit region of the fan,

wherein the widening of the air guide structure begins in the region of the air inlet edges of the blades, and wherein the air guiding contour of the air guide structure conforms to the contours of the fan blades,

wherein the air guide structure is formed in part by the hub and by a guide ring fixedly connected with the ends of the blades,

wherein a fixed nozzles protrudes in the inlet opening formed at the inlet edge of the guide ring, and

wherein the inlet nozzle which protrudes into the guide ring expands in a curved shape in the flow direction from its smallest cross section advantageously located behind the inlet edge of the guide ring.

4,566,853

WINDMILL

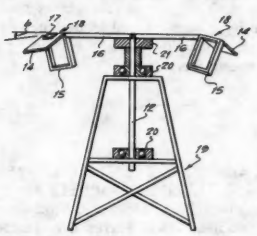
Chalerm Likitanupak, 16/25-26 Soi Watana (19), Sukhumvit Rd., Bangkok 11, Thailand

Filed Jun. 23, 1983, Ser. No. 507,431

Claims priority, application United Kingdom, Jun. 25, 1982, 8218529

Int. Cl.⁴ F03D *3/06*

U.S. Cl. 416—117 **8 Claims**



1. A vertical axis windmill comprising:

an upright central axis;

a plurality of horizontal arms mounted for rotation in a substantially horizontal plane about said upright central axis;

a plurality of frames, each frame being substantially vertical and coupled to a free end of one of said arms, each of said frames having an uppermost section extending downwardly from one of said arms at a tilt angle of from 20° to 80° from said arm and extending forwardly from said arm in the direction of rotation of said arm at a pitch angle in the same plane as said arm of from 5° to 30° from said arm; and

a plurality of blades, each blade being hinged at an edge thereof to said uppermost section of one of said frames, each blade being shaped so that upon rotation about said hinged edge said blade will contact said frame in said substantially vertical position thereby preventing further rotation of said blade.

4,566,854

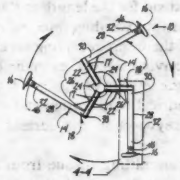
WIND ROTOR

Ray J. Slezak, 1110 - 28th St., West Des Moines, Iowa 50265

Filed May 21, 1984, Ser. No. 612,707

Int. Cl.⁴ F03D *7/06*

U.S. Cl. 416—119 **10 Claims**



1. A wind rotor for use with an electrical generator, comprising:

an elongated vertically disposed, rotatable shaft operatively connected to said generator;

a plurality of horizontally disposed and uniformly spaced inner arm members having a first end attached to said shaft and a second end extending radially outwardly therefrom;

a plurality of horizontally disposed outer arm members each being secured to said second end of one of said inner arm

members and being angularly disposed with respect to said one inner arm member;

a plurality of vertically disposed airfoil blades each having a leading edge, a trailing edge, and opposite first and second surfaces and each blade being connected to one of said outer arm members such that the chord line thereof is substantially parallel to the longitudinal axis of the respective inner arm member to which the outer arm member is attached, whereby the movement of a compressible gaseous fluid with respect to said blades generates aerodynamic lifting forces on said blades thereby rotating said rotor; and connection means for securing said blades to said outer arm members.

4,566,855

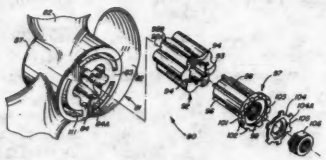
SHOCK ABSORBING CLUTCH ASSEMBLY FOR MARINE PROPELLER

John J. Costabile, 7037 E. Moreland, Scottsdale, Ariz. 85257; Arvid B. Costabile, 2716 E. Forrest Cir., Tempe, Ariz. 85281, and Ernest Costabile, 1833 E. Carven Rd., Tempe, Ariz. 85284

Continuation-in-part of Ser. No. 297,343, Aug. 28, 1981, Pat. No. 4,417,852. This application Nov. 23, 1983, Ser. No. 554,842

Int. Cl.[4] B63H *1/20*

U.S. Cl. 416—134 R **8 Claims**



1. A marine propeller comprising in combination:

(a) a hub having therein an insert-receiving recess that is coaxial with the hub, the insert-receiving recess having a predetermined depth and a uniform, generally rose-shaped cross-sectional shape, with alternating longitudinal peaks and valleys on the inner wall extending from an open end of the insert-receiving recess to a bottom surface of the insert-receiving recess;

(b) a resilient insert disposed in the insert-receiving recess and having a predetermined length that is approximately equal to the predetermined depth of the insert-receiving recess, and having a uniform, generally rose-shaped cross-sectional shape with alternate longitudinal peaks and valleys that extend for the length of the resilient insert, the peaks of the insert extending into and mating closely with the valleys of the insert-receiving recess and the peaks of the insert-receiving recess extending into and mating closely with the valleys of the insert, the insert including an axial, cylindrical hole therein and a plurality of spaced longitudinal keyways in the surface of the cylindrical hole; and

(c) means for transmitting torque from a driveshaft to the resilient insert by means of the keyways thereof, the torque transmitting means including a plurality of elongated, longitudinal splines extending into the respective keyways,

each of the elongated keys being approximately aligned with a respective valley of the resilient insert to provide a substantial amount of mass of the resilient insert located between sloped walls of each of the peaks of the insert-receiving means and a side wall of a respective one of the splines in order to allow a substantial amount of compression of, and hence shock absorbing capability in that mass of the resilient insert.

4,566,856

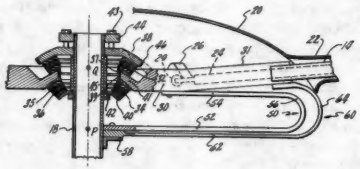
HELICOPTER GIMBAL ROTOR

Gordon G. Miller, Shelton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 27, 1984, Ser. No. 655,385

Int. Cl.[4] B64C *27/33, 27/35*

U.S. Cl. 416—134 A **1 Claim**



1. A gimballed rotor system for a helicopter having a rotorshaft (18), a hub member (28) that is freely tiltable about a point (P) on the rotorshaft axis, and blades (12) that are radially attached to the hub member (28) in a rotor plane that nominally intersects the rotorshaft axis at a point (Q), which is above the point (P), characterized by:

a plurality of long flat U-shaped springs (50) for providing a hub moment, each spring having an outward leg (52), an inward leg (54) and a bight (56), wherein the inboard end of the outward leg is attached to the rotorshaft in-plane with the point (P) and the inboard end of the inward leg is attached to the hub member; and

a disc 60 for transmitting torque from the rotorshaft to the hub, having a resilient diaphragm portion (62) attached to the rotorshaft (18) in-plane with the point (P) and a rigid rim attached to the hub member (28).

4,566,857

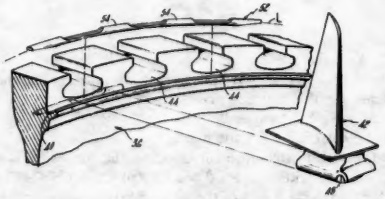
LOCKING OF ROTOR BLADES ON A ROTOR DISK

Claudio Brumen, Denver, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 218,241, Dec. 19, 1980, Pat. No. 4,389,161. This application Mar. 25, 1983, Ser. No. 478,949

Int. Cl.[4] F01D *5/32*

U.S. Cl. 416—220 R **2 Claims**



1. A scalloped locking pin for trapping at least two blades in adjacent slots having a width W on a rotor disk of a rotor assembly of an axial flow rotary machine to prevent fore and aft movement of each blade, the pin having a first end, a second end, a longitudinal axis L which extends between the ends and a plurality of lugs extending laterally from one side of the pin and spaced one from another a distance greater than the width W to permit passage of the blade therethrough, and at least one of the lugs is disposed about the longitudinal axis L and has a cross-sectional shape which is symmetrically disposed about the axis L.

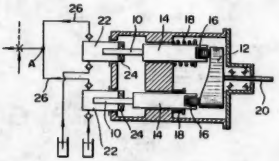
4,566,858
PULSATION-FREE VOLUMETRIC PUMP

Takashi Akiba, Tokyo, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 309,579, Oct. 8, 1981, abandoned. This application Jun. 12, 1984, Ser. No. 619,738

Int. Cl.⁴ F04B *49/06, 49/08*

U.S. Cl. 417—22 **2 Claims**



1. A pulsation-free reciprocating volumetric pump comprising a pump housing having two plungers providing a combined discharge volume, a cam for driving said plungers, a direct current driving motor connected to said cam, a rotation setting means operatively connected to said driving motor for supplying thereto a predetermined direct current voltage for driving the motor at a predetermined rotational rate, a main amplifier operatively connected to said rotation setteing means for supply thereto as a first input the direct current voltage from the rotation setting means, said main amplifier having an output supplied to said drive motor, a tachogenerator operatively connected to said drive motor for drive thereby and supplying its output voltage as a second input to said main amplifier, and means for compensating for pressure pulsations produced during pumping, said last-named means comprising a pressure detector for detecting the pressure of said combined discharge volume and providing an output signal having a direct current component and an alternating current component representative of said pressure pulsations, means eliminating the direct current component of the pressure detector output signal and passing only the alternating current component, an amplifier circuit for amplifying the alternating current component, and adding means supplied with the direct current voltage from the rotation setting means and with the amplified alternating current component from the amplifier circuit for adding said alternating current component, after phase reversal, to the direct current voltage from the rotation setting means for modifying said first input voltage to said main amplifier in a sense to modify the rotation rate of the drive motor to compensate for said pressure pulsations.

4,566,859
METHOD FOR CARRYING LIQUID METAL BY TWO SERIES-CONNECTED ELECTRIC MAGNET PUMPS

Klaus Thissen, Cologne, and Joachim Barzantny, Kürten-Eichhof, both of Fed. Rep. of Germany, assignors to Interatom Internationale Atomreaktorbau GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

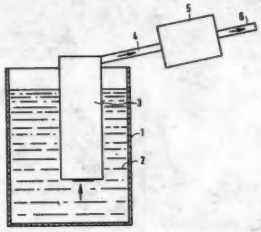
Filed Feb. 9, 1984, Ser. No. 578,548

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322122

Int. Cl.⁴ H02K *44/02*

U.S. Cl. 417—50 **7 Claims**

1. Method for feeding controlled amounts of molten metal from a body of molten metal in a vessel, which comprises continuously operating an electromagnetic immersion pump immersed in the body of molten metal at a fixed output, discharging the output of the immersion pump through a conveying canal extending outside the body of molten metal, conveying the output from the conveying canal into an electromagnetic canal pump connected thereto, operating the canal pump at intervals to pump with a given output for a given time together with the immersion pump in the same direction of flow of molten metal, operating the canal pump at other intervals to pump in a reverse direction which is counter to the flow of metal from the immersion pump, and discharging controlled



amounts of molten metal from a discharge opening in the canal pump.

4,566,860
LIQUID PISTON COMPRESSION SYSTEMS FOR COMPRESSING STEAM

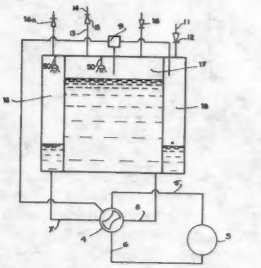
Ben Cowan, 5757 Cavendish Blvd., Montreal, Quebec, Canada (H4W 3W8)

Filed Apr. 9, 1984, Ser. No. 598,035

Claims priority, application Canada, Mar. 28, 1984, 450687

Int. Cl.⁴ F04F *11/00*

U.S. Cl. 417—102 **11 Claims**



1. An apparatus for compressing steam, comprising:

first and second compression chambers, each said chamber containing a quantity of compressing liquid, said liquid defining in each chamber a liquid level and a space above said liquid level;

unidirectional flow means in fluid communication with each said chamber, said flow means including a low pressure steam inflow conduit and a high pressure steam outflow conduit;

means for displacing the compressing liquid in said first chamber outwardly to thereby lower said liquid level therein and induce a suction stroke for admitting steam into said space in said first chamber, and simultaneously for displacing the compressing liquid in said second chamber inwardly to thereby raise said liquid level therein and induce a compression stroke for compressing steam in said second chamber;

means for reversing the displacement in cyclic fashion to thereby induce a compression stroke in said first chamber and a suction stroke in said second chamber;

means for desuperheating said steam during said compression strokes, said means including a separate water spray positioned in said space of each said chamber; and

wherein said steam inflow conduit admits low pressure steam during said suction stroke, and wherein said steam

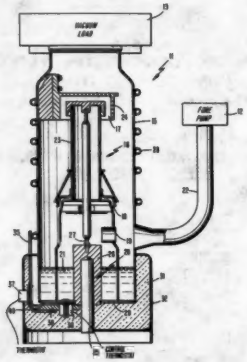
outflow conduit releases high pressure steam during said compression stroke.

4,566,861

METHOD OF AND APPARATUS FOR OPERATING A DIFFUSION PUMP

Arthur A. Landfors, Brookline, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 7, 1984, Ser. No. 607,867
Int. Cl.⁴ F04F *9/00*
U.S. Cl. 417—54 **11 Claims**



1. A method of operating a diffusion pump having a pool of liquid that is heated to a vapor and has a condensation surface for the vapor, the surface being supplied with a coolant fluid during normal operation of the pump, comprising the steps of determining the effectiveness of the fluid by: sensing the temperature of the pool, establishing a temperature gradient from the pool to the surface, and sensing the temperature at an intermediate location on the gradient; and controlling the rate of which the vapor is evaporated in response to an indication of the effectiveness of the fluid in cooling the condensation surface so that when the fluid is determined as being completely ineffective in cooling the surface liquid is vaporized from the pool but at a slower rate than when the fluid is effective in cooling the surface, the rate of evaporation being controlled by controlling the amount of power supplied to a heater for the liquid in response to both of the sensed temperatures.

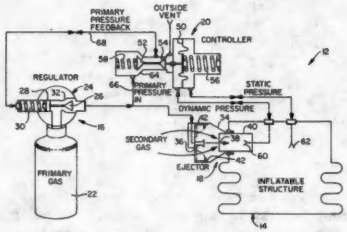
4. A diffusion pump comprising a pool of liquid, means for vaporizing liquid in the pool, a condensation surface on which the vaporized liquid is incident, means for cooling the condensation surface with a cooling fluid, means for sensing the effectiveness of the fluid in cooling the surface effectively to determine whether or not the cooling fluid is being supplied to the means for cooling, the means for sensing including means for sensing temperatures at two locations normally having disparate temperatures along a temperature gradient extending from the condensation surface to the pool, and means responsive to the sensed temperatures for controlling the vaporizing means to control the rate at which liquid is evaporated from the pool so that when the fluid is completely ineffective in cooling the surface liquid is vaporized from the pool but at a slower rate than when the fluid is effective in cooling the surface.

4,566,862

FLUID APPARATUS AND METHODS, AS FOR INFLATING INFLATABLE STRUCTURES

Richard A. Halavais, Pompton Lakes, N.J., assignor to General Pneumatics Corporation, Orange, N.J.

Continuation of Ser. No. 351,587, Feb. 23, 1982, abandoned.
This application Jul. 19, 1984, Ser. No. 632,267
Int. Cl.⁴ F04F *5/48*
U.S. Cl. 417—189 **8 Claims**



1. Apparatus for controlling the pressure of a primary gas supplied to a mass flow augmentation device of the type that employs the flow of the primary gas through a containment structure for entraining a secondary fluid to produce a combined fluid flow through the containment structure, comprising a housing having a portion adapted to be received within a base member of the mass flow augmentation device, pressure sensitive means disposed within the housing, means for applying a static pressure to the pressure sensitive means, and means responsive to the pressure sensitive means for supplying an output signal adapted for controlling the primary gas pressure dependent upon the static pressure, said housing comprising a cup-shaped member having an elongated tubular portion extending therefrom, the tubular portion being adapted to be received within an opening in the base member with an adjacent surface of the cup-shaped member in engagement with a surface of the base member, the static pressure applying means comprising a groove in said surface of the cup-shaped member adapted to be aligned with a hole in the surface of the base member that is in communication with a static pressure sensor, the cup-shaped member having another hole therein to provide a passageway between the groove and a chamber within the housing.

4,566,863

ROTARY COMPRESSOR OPERABLE UNDER A PARTIAL DELIVERY CAPACITY

Kunifumi Goto, Nagoya; Manabu Sugiura, Takahama, and Shinichi Suzuki, Okazaki, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 17, 1984, Ser. No. 651,612
Claims priority, application Japan, Sep. 16, 1983, 58-171969
Int. Cl.⁴ F04B *49/02, 49/08*
U.S. Cl. 417—295 **19 Claims**

1. A rotary compressor for compressing a refrigerant gas, comprising:

a housing;

a drive shaft rotatably supported in said housing and having a rotor thereon which is rotatable with said drive shaft;

means defining a plurality of compression chambers whose respective volumes sequentially and progressively increase from substantially zero to a maximum volume and thereafter decrease from said maximum volume to substantially zero responsive to rotation of said rotor;

means defining a suction chamber within said housing for containing refrigerant gas to be introduced into said compression chambers;

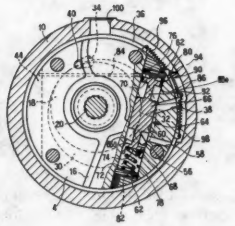
means defining a suction passage within said housing extend-

ing between said suction chamber and at least one of said compression chambers whose volume is being increased;

means defining a discharge chamber within said housing for receiving compressed refrigerant gas from at least one of said compression chambers whose volume is being decreased;

means defining a by-pass passage within said housing extending between said suction chamber and one of said compression chambers whose volume is being decreased;

control valve means within said housing including a valve member movable between a first position thereof opening



said suction passage and closing said by-pass passage and a second position thereof at least partially closing said suction passage and opening said by-pass passage, and means biasing said valve member towards its said second position;

means for exposing said valve member to compressed refrigerant gas pressure urging said valve member towards its said first position;

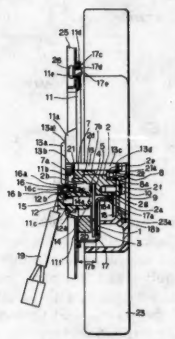
and means for exposing said valve member to suction chamber refrigerant gas pressure urging said valve member towards its said second position.

4,566,864

ELECTRIC FAN DEVICE FOR AUTOMOTIVE VEHICLE

Yosizi Yamamoto, Toyohashi, and Toshio Ishikawa, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 484,360, Apr. 12, 1983, abandoned.
This application May 29, 1985, Ser. No. 739,483
Claims priority, application Japan, Apr. 14, 1982, 57-54819[U]; Apr. 14, 1982, 57-54820[U]
Int. Cl.⁴ F04B *35/04;* H02K *1/28*
U.S. Cl. 417—353 **5 Claims**



1. An electrically-operated, automotive cooling fan device, comprising:

first and second housing members joined to define between them a motor chamber;

a shaft fixed to said first housing member and extending within said motor chamber;

bearing means mounted on said shaft;

a rotor rotatably supported on said shaft by said bearing-means, said rotor extending within said motor chamber and having an end exposed externally of said motor chamber;

an armature disk fixed to said rotor and extending radially outwardly therefrom within said motor chamber;

magnetic field means fixed to one of said housings and being thereby disposed to face said armature plate within said motor chamber for generating a magnetic flux as said rotor is turned;

a heat-radiating member fixed to said rotor at said exposed end of said rotor, so that said heat-radiating member is juxtaposed with said motor chamber but located externally of said motor chamber, said heat radiating member having a radially outer periphery; and

an annular, automotive cooling fan fixed to said heat-radiating member at said radially outer periphery of said heat-radiating member and extending therefrom, with said heat-radiating member thereby being constructed and arranged to function as a hub for said fan;

said heat-radiating member being made of heat-conductive metallic material and having an axially outer, radially central portion which is exposed externally of said device for radiating heat therefrom;

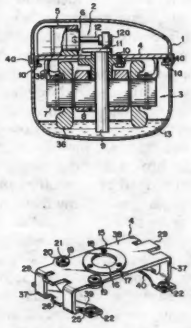
one of said housing members including contiguous portions made of heat-conductive metallic material juxtaposed with said armature disk and said heat-radiating member, whereby heat generated in said armature disk may be conducted to proximity of said heat-radiating member, radiate to said heat-radiating member, be conducted through said heat-radiating member and be radiated to externally of said device from said heat-radiating member.

4,566,865

CLOSED TYPE COMPRESSOR

Kazuichi Nishitsuji, Kawasaki; Eiichi Aikawa, and Yukio Haraguchi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1984, Ser. No. 634,495
Claims priority, application Japan, Jul. 29, 1983, 58-137578
Int. Cl.⁴ F04B *35/04;* F16M *1/02*
U.S. Cl. 417—363 **7 Claims**



1. A closed type compressor comprising:

a case;

a frame provided within said case;

a compressor and an electric motor both attached to said frame;

said frame being U-shaped and comprising an elongated sheet material member and a plurality of embossed portions integrally formed at positions of said sheet material

member where said compressor and electric motor attach respectively thereto, and each of said portions having a through hole;

said sheet material member comprising a central portion, bent leg portions defined by end portions of said sheet material member which are substantially perpendicular, and ends defined by tip ends of said leg portions angled substantially perpendicular to said leg portions so as to face said central portion, with said embossed portions formed on said central portion and said ends of said sheet member, respectively, being formed at said positions so that said respective through holes thereof are not in axial alignment;

fixing means which pass through the through holes for fixing said motor and compressor on their respective embossed portions; and

means for supporting said frame within said case so that said central portion of said sheet member is pointed in a direction opposite to said ends thereof.

4,566,866

AGGREGATE FOR FEEDING OF FUEL TO INTERNAL COMBUSTION ENGINE PARTICULARLY OF POWER VEHICLE

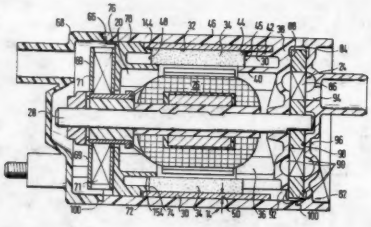
Ulrich Kemmner, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,561

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321241

Int. Cl.⁴ F04B *35/04*; F04D *5/00*

U.S. Cl. 417—366 **18 Claims**



1. An aggregate for feeding a fuel from a supply container to an internal combustion engine, particularly of a power vehicle, comprsing means forming a feeding chamber; a feeding pump having a feeding member rotatable in said feeding chamber; an electric drive motor for said feeding pump and having a motor armature connected with said feeding member of said feeding pump; means forming a space which surrounds said motor armature and through which a fuel flows; a weak magnetic tubular part surrounding said motor armature and having an inner wall; at least one permanent magnet having a substantially ring-segment shaped cross section and arranged on said inner wall of said part; an intermediate wall separating said feeding chamber from said space, said intermediate wall having a tubular projection which surrounds said part and a pocket provided on said intermediate wall inside said tubular projection for receiving a portion of said permanet magnet, said intermediate wall having a side facing away of said tubular projection and being provided at said side with an annular projection; and a closing cover mounted on said annular projection so that said closing cover and said side of said intermediate wall together form said means forming said feeding chamber for said feeding member of said feeding pump, said permanent magnet having another portion spaced from said first-mentioned portion, said tubular projection of said intermediate wall extending outwardly beyond said tubular part, said intermediate wall having a side facing away from said tubular projection; and a ring insertable from said side of said intermediate wall and axially abutting against said tubular part, said ring being provided with a receiving pocket for receiving the other portion of said permanent magnet.

4,566,867

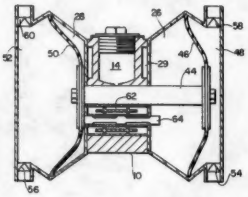
DUAL DIAPHRAGM PUMP

Alberto Bazan, 4928 Scott's Creek Trail, Duluth, Ga. 30136, and Donald M. Murphy, 739 Oak View Ct., Lilburn, Ga. 30093

Filed Jul. 2, 1984, Ser. No. 626,915

Int. Cl.⁴ F04B *43/06*

U.S. Cl. 417—393 **17 Claims**



1. A gas operated dual diaphragm pump comprising:

a gas inlet aperture for fluid communication with a supply of compressed gas;

a high pressure chamber in fluid communication with said inlet aperture;

an outlet aperture adapted for fluid communication to the atmosphere;

a low pressure chamber in fluid communication with said outlet aperture;

first and second diaphragm chamber;

a distribution valve in selective fluid communication with said high pressure chamber, said low pressure chamber and said diaphragm chambers; and

means for bleeding gas from said high pressure chamber to said low pressure chamber without passing through said gas distribution valve.

4,566,868

PRESSURE SOURCE

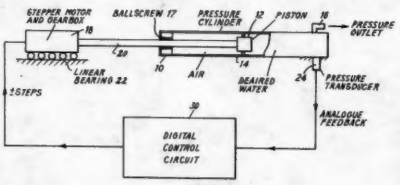
Bruce K. Menzies, Walton-On-Thames, England, assignor to Geotechnical Digital Systems Limited, Surrey, England

Filed Sep. 11, 1981, Ser. No. 301,084

Claims priority, application United Kingdom, Sep. 17, 1980, 8030082

Int. Cl.⁴ F04B *49/06, 49/08, 35/04*; G01N *3/10*

U.S. Cl. 417—572 **14 Claims**



1. A liquid pressure source comprising a piston and cylinder unit embodying a cylinder having at one end a pressure outlet, a piston in the cylinder movable reciprocally therein to generate a pressure at said outlet, a recirculating ball screw assembly at the other end of the cylinder, a threaded piston rod connected at one end to the piston, said threaded piston rod extending from the piston through said recirculating ball screw at said other end of the cylinder, a stepping motor, means non-rotatably supporting the stepping motor for rectilinear movement relative to the cylinder, said stepping motor including a rotor, means connecting the rotor to said piston rod such that rotation of the piston rod by way of the recirculating ball

screw effects rectilinear movement of the stepping motor and piston, a pressure transducer at said one end of the cylinder operable to produce electric signals indicative of the fluid pressure generated at the outlet of the cylinder, means for generating signals representing the desired pressure, a digital feedback control means responsive to said transducer signals and to the signals representing said desired pressure to provide said stepping impulses to said stepping motor in a sense such as to reduce the difference between the actual and the desired pressure and a volume charge counter means coupled to said digital feedback control means to count said stepping pulses so as to indicate the change in volume.

4,566,869

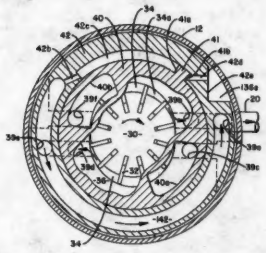
REVERSIBLE MULTI-VANE ROTARY COMPRESSOR

Prakash N. Pandeya, Clay, and Tsuwei Chu, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 18, 1984, Ser. No. 682,869

Int. Cl.[4] F04C *25/00, 29/08;* F25B *13/00*

U.S. Cl. 418—15 **6 Claims**



1. A reversible hermetic compressor unit comprising:
shell means having first and second lines connected thereto;
rotary compressor means within said shell means;
motor means within said shell means for selectively driving said rotary compressor means in a clockwise or a counter-clockwise direction;
said rotary compressor means including:
a compressor chamber with a rotatable multi-vane rotor therein;
a first pair of fluid passage means fluidly connected to said first line and said compressor chamber;
a second pair of fluid passage means fluidly connected to said second fluid line and said compressor chamber; and
means including a pair of supplemental suction ports movable in response to the pressure differential between said first and second lines to position said pair of supplemental suction ports in communication with either said first pair of fluid passage means or said second pair of passage means and said chamber according to which of said first and second pair of fluid passage means are suction lines as determined by the direction in which said motor means drives said rotary compressor means.

4,566,870

ADJUSTABLE VANE-TYPE PUMP

Manfred Kahrs, Wiesbaden, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

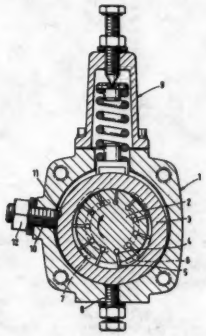
Filed Aug. 29, 1983, Ser. No. 527,250

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240367

Int. Cl.[4] F01C *21/16*

U.S. Cl. 418—30 **1 Claim**

1. An adjustable vane-type pump comprising an enclosing housing, a rotor rotatable on an axis within said housing past a suction port on one side of the rotor and a pressure port on the opposite side of said rotor, means in said rotor on rotation thereof for placing said ports in communication to pump fluid from the suction port to the pressure port, a cam ring eccentrically encircling said rotor and displaceable radially relative to said rotor, said cam ring comprising an outer curved surface resting within said housing, means for adjusting the position of said cam ring radially relative to said rotor for limiting the volume delivered by said pump, pressure control means diametrically opposite said position adjustment to set a bias pressure applied to said cam ring, and a further adjusting means at the pressure port side of the cam ring and positioned to bear against the cam ring to control the pre-compression of fluid



passing from said suction port to said pressure port, said further adjusting means comprising a planar surface applying a settable pressure against said cam ring, said planar surface comprising the end face of a bolt threaded through an opening in the enclosing housing to bear against said cam ring, said bolt being inclined at a single predetermined acute angle relative to the axis of the pressure control means with said planar surface applied generally at the axis of said rotor to the extension of said cam ring, to minimize noise over the operating range of the pump.

4,566,871

APPARATUS FOR MAKING A PARISON FOR BLOWMOLDING OF A HOLLOW ARTICLE

Norbert Höne; Claus Horwege, and Otto Rosenkranz, all of Hamburg, Fed. Rep. of Germany, assignors to Krupp Corpoplast Maschinenbau GmbH, Fed. Rep. of Germany

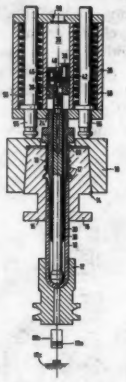
Division of Ser. No. 335,884, Dec. 30, 1981, Pat. No. 4,499,044. This application Jan. 25, 1984, Ser. No. 573,697

Int. Cl.[4] B29D *23/03*

U.S. Cl. 425—525 **6 Claims**

1. In an improved apparatus for making a parison for blowmolding a hollow body of the thermoplastic material comprising; a holding means for locating and securing the parison in a molding position, a finish mold disposable around a portion of the parison and an elongated forming mandrel having a central bore, said forming mandrel being displaceable in the longitudinal axial direction of the parison and insertable into the parison, the improvement comprising: a stretching pin located in the central bore of said forming mandrel, said stretching pin being outwardly extendable from said forming mandrel and axially displaceable in said bore with respect to said parison into contact with the bottom of said parison, and an actuating means for said forming mandrel and said stretching pin for first moving said forming mandrel and said stretching pin into said parison after said finish mold is disposed around a portion of said parison for locking said parison in said finish mold and subsquently moving said stretching pin in said central bore of

said forming mandrel with respect to said parison and outwardly from said forming mandrel into contact with the bottom of said parison for stretching said parison by the contact with the bottom of the parison.

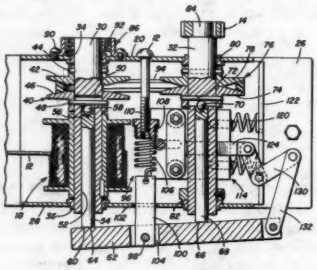


4,566,872

VARIABLE SPEED TRANSMISSION FOR PORTABLE WINCH

Norman D. Brockelsby, 1127 N. Sherman, Grand Island, Nebr. 68801

Filed Jun. 8, 1984, Ser. No. 619,309
Int. Cl.⁴ F16H *7/08*
U.S. Cl. 474—101 **12 Claims**



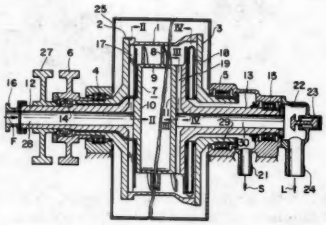
1. In a variable speed transmission having a housing, a pair of drive shafts rotatably mounted by the housing in spaced relation to each other, a pair of pulleys respectively connected to said drive shafts, an endless drive belt entrained about said pulleys and a belt tightening device operatively connected to said pulleys for maintaining the belt in operatively tensioned condition, the improvement residing in means for automatically varying the drive ratio between said drive shafts as functions of the torques applied thereto, comprising a belt tightening device for establishing a predetermined belt tensioning force, means for dividing said belt tensioning force into distributed force components, force transfer means for respectively transmitting the distributed force components to the pulleys to establish the tensioned condition of the drive belt and means for applying a load force to the force dividing means to establish said drive ratio.

4,566,873

SCREW DECANTER TYPE CENTRIFUGAL CONCENTRATING MACHINE

Toshiyuki Toda, Hiroshima, Japan, assignor to Kotobuki Engineering & Manufacturing Co., Ltd., Kure, Japan

Filed Mar. 28, 1984, Ser. No. 594,297
Int. Cl.⁴ B04B *1/20, 11/02*
U.S. Cl. 494—53 **5 Claims**



1. A screw decanter type centrifugal concentrating machine of the type including a bowl having side walls and a screw conveyor rotatably supported within said bowl in the coaxial relation relative to the latter by means of hollow shafts fixedly secured to both of said side walls of said bowl, said screw conveyor being rotated at a different rotational speed from that of the bowl, characterized in that liquid initially supplied prior to separating, concentrated liquid and residual liquid after completion of separation in the bowl are continously supplied and discharged through the hollow space in the hollow shafts of the bowl and the screw conveyor and that throttle valves are disposed in the discharge passages extending from the hollow shaft for at least one of concentrated liquid and residual liquid.

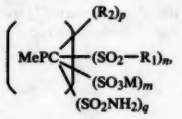
4,566,874

WATER-SOLUBLE ZINC AND ALUMINIUM PHTHALOCYANINES AND USE THEREOF AS PHOTOACTIVATORS

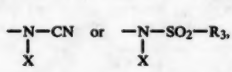
Gerd Hölzle, Liestal; Mirella Miotto, Basel; Gerhard Reinert, Allschwil, and Rudolf Polony, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 445,784, Dec. 1, 1982, Pat. No. 4,497,741.
This application Dec. 5, 1984, Ser. No. 678,314
Int. Cl.[4] D06L *3/04*
U.S. Cl. 8—103 **17 Claims**

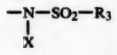
1. A process for bleaching and removing stains from textiles, which process comprises treating said textiles, in the presence of water and under irradiation with light, with a zinc or aluminum phthalocyananine compound of the formula



wherein MePc is the zinc or aluminium phthalocyanine ring system, M is hydrogen or the equivalent of a salt-forming cation, R_1 is hydrogen, M or a group of the formula



wherein X is hydrogen or ammonium or the equivalent of a monovalent, divalent or trivalent metal ion, and R_3 is unsubstituted or substituted C_1–C_2 alkyl, unsubstituted or substituted aryl or an unsubstituted or substituted and/or fused 5- or 6-membered aromatic heterocyclic ring containing one or two nitrogen, oxygen or sulfur heteroatoms; R_2 is independently halogen, aryl or cyano, n has any value from 1 to 4, each of m and q has any value from 0 to 3 and p has any value from 0 to 4, while the sum of n+m and n+q in each case is 1 to 4 and q is only different from 0 if R_1 is a group of the formula



and m is 0, and the substituents R_2 present in the molecule may be the same or different.

4,566,875

TWO-STAGE PROCESS FOR DYEING KERATIN FIBRES AND COMPOSITION FOR USE THEREIN

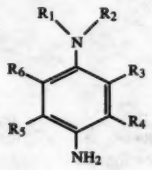
Jean F. Grollier, and Chantal Fourcadier, both of Paris, France, assignors to L'Oreal, Paris, France

Filed Apr. 5, 1979, Ser. No. 27,400
Claims priority, application France, Apr. 6, 1978, 78 10276
Int. Cl.[4] A45D *7/00*; A61K *7/13*; D06P *5/00*
U.S. Cl. 8—406 **7 Claims**

1. A process for dyeing hair which comprises applying to the hair for 5 to 45 minutes a first composition containing at least one mercaptan corresponding to the formula:

(I)

in which R denotes an alkylene group bonded to a group of the formula —COOH, —$CONH_2$, —OH, —SH or —COOR', R' denoting an unsubstituted alkyl group or hydroxy-substituted alkyl group, said alkylene group being unsubstituted or substituted by one or more lower alkyl, amino or COOH groups, an ammonium, alkali metal or alkaline earth metal salt thereof or an organic or inorganic acid addition salt thereof, present in an amount greater than 1% and less than 5% by weight and subsequently without intermediate rinsing applying to the hair for 5 to 40 minutes an oxidising composition so as to develop an oxidisable dyestuff applied to the hair, said oxidisable dyestuff being a paraphenylenediamine of the formula:



(II)

in which R_1 and R_2 independently of one another denote hydrogen; phenyl; furfuryl; tetrahydrofurfuryl; a linear or branched alkyl group which is unsubstituted or chain-terminated by a hydroxyl, alkoxy or a primary, secondary or tertiary amino group, acylamino, alkyl- or arylsulphonylamino, carbalkoxyamino, ureido, carboxyl, carbamyl in which the nitrogen atom is unsubstituted or mono- or di-substituted, sulpho, sulphonamido in which the nitrogen atom is unsubstituted or mono- or di-substituted, said alkyl groups including alkyl groups containing an oxygen or nitrogen atom and alkyl groups substituted by other hydroxy or amino groups; or R_1 and R_2 together form, with the nitrogen atom to which they are attached, a piperidino or morpholino ring; and R_3, R_4, R_5 and R_6 independently of one another denote hydrogen, halogen, linear or branched alkyl which is unsubstituted or substituted by one or more OH, amino or alkoxy groups, or a group OZ, Z denoting alkyl, hydroxyalkyl, alkoxyalkyl, acylaminoalkyl, carbalkoxyaminoalkyl, mesylaminoalkyl, ureidoalkyl, aminoalkyl or mono- or di-alkylaminoalkyl, with the proviso that if R_2 denotes phenyl, R_1, R_3, R_4, R_5 and R_6 denote hydrogen, and that if R_1 and R_2 are both different from hydrogen, R_3 and R_6 both denote hydrogen, and that if R_1 and R_2 simultaneously denote hydrogen, at least two of the substituents R_3, R_4, R_5 and R_6 are different from hydrogen; or an organic or inorganic acid salt thereof; a para-aminophenol, a 2,5-diamino pyridine, an amino benzomorpholine, or a N,N'-diarylalkylenediamine in which the aryl groups are substituted in the para position by an OH, amino or amino substituted by alkyl, unsubstituted or substituted on the nucleus by alkyl or halogen, and in which the alkylene group is uninterrupted or interrupted by O or N or is unsubstituted or substituted by OH or an alkyl group, the nitrogen atoms carried by the alkylenediamine groups being unsubstituted or substituted by an alkyl, hydroxyalkyl or aminoalkyl group, present in an amount of 0.005 to 10% by weight, or a 4,4'-diaminodiphenylamine, a 4-hydroxy 4'-aminodiphenylamine or a 4,4'-dihydroxydiphenylamine present in an amount of 0.005 to 4% by weight, or pyrogallol, 1,2,4-trihydroxybenzene, 1,3,5-trihydroxybenzene, 1,4,5-trihydroxynaphthalene, 2,4,5-trihydroxytoluene, alphajuglone, triaminobenzene, di- or tri-aminophenol, polyaminopolyhydroxybenzene present in an amount of 0.01 to 8% by weight.

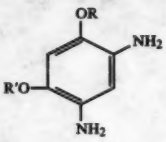
4,566,876

META-PHENYLENEDIAMINE COUPLER COMPOUNDS AND OXIDATIVE HAIR DYE COMPOSITIONS AND METHODS USING SAME

Keith C. Brown, New Canaan, and John F. Corbett, Norwalk, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

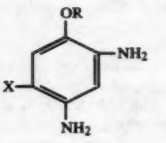
Filed Mar. 10, 1983, Ser. No. 474,110
Int. Cl.[4] C07C *91/42*; A61K *7/13*
U.S. Cl. 8—411 **14 Claims**

1. An oxidation dye coupler compound of the formula:



wherein each of R and R' independently represent mono or poly-hydroxy (C_1–C_4) alkyl or an acid addition salt thereof.

6. A hair dyeing composition comprising an aqueous mixture of at least one oxidation dye coupler of the following formula:



wherein R and R' are independently mono or polyhydroxy (C_1–C_4) alkyl or an acid addition salt thereof, and X represents the group —OR' where R' has the same meaning as R', the groups —OR and —OR' may be the same or different; and at least one oxidation base developer compound, said coupler and said developer being reactive with each other in the presence of an oxidizing agent to form a colored dye on hair.

4,566,877

CARBON FOAM USABLE AS BLAST-FURNACE FUEL AND METHOD OF MAKING SAME

Richard Pazdej, Maizieres-les-Metz, and Albert Pavinato, Metz-Vallieres, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-German-en-Laye, France

Filed Apr. 9, 1984, Ser. No. 598,574
Claims priority, application France, Apr. 7, 1983, 83 05826
Int. Cl.[4] C10L *1/36*
U.S. Cl. 44—51 **13 Claims**

1. A mixture comprising:

at least 70% by weight of a solid carbon-rich material;

between 0.07% and 3.5% by weight of a foaming surfactant; and

balance gaseous bubbles and aqueous liquid capable of suspending the carbon-rich material.

4,566,878

REACTION PRODUCT OF BETA-MERCAPTOETHANOL AND COCONUT OIL AS DIESEL FUEL ANTIWEAR ADDITIVE

Thomas J. Karol, Norwalk, Conn., and Rodney L. Sung, Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,650
Int. Cl.[4] C10L *1/24*
U.S. Cl. 44—57 **20 Claims**

1. A diesel fuel composition characterized by improved wear resistance which comprises a major portion of a diesel fuel; and a minor wear resistance portion of, as an additive, a hydroxy hydrocarbyl mercapto ester of a C_1–C_{40} fatty acid.

4,566,879

FUELS CONTAINING SULFURIZED ORGANIC ACID DIAMINE SALTS

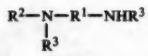
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Company, New York, N.Y.

Division of Ser. No. 535,132, Sep. 23, 1983. This application Jun. 5, 1985, Ser. No. 741,429
Int. Cl.[4] C10L *1/22, 1/24*
U.S. Cl. 44—71 **11 Claims**

1. A liquid fuel composition comprising a major proportion of fuel and a friction reducing amount of an acid-amine salt prepared by reacting a sulfurized carboxylic acid of the formula

R-COOH

where R is a C_{10} to C_{20} unsaturated hydrocarbyl group, at from about 20° C. to about 120° C., with a diamine of the formula



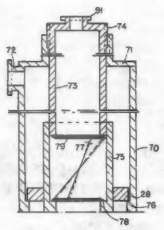
wherein R^1 is a C_2 to C_4 hydrocarbylene group, R^2 is a C_{12} to C_{30} hydrocarbyl group and R^3 is hydrogen or a C_1 to C_6 hydrocarbyl group, using a molar ratio of sulfurized acid to diamine of from about 1:1 to about 4:1.

4,566,880

REACTOR FOR COAL GASIFICATION

Jürgen Seipenbusch, Essen, and Hans Dohren, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 98,917, Nov. 30, 1979, Pat. No. 4,352,675. This application Sep. 27, 1982, Ser. No. 424,638
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2852704
Int. Cl.[4] C10J *3/50*
U.S. Cl. 48—73 **2 Claims**



1. A reactor for coal gasification wherein oxidation of a solid material containing carbon in the presence of water, produces a carbon monoxide and a hydrogen containing gas, comprising:

a vortex burner having an inner conduit for admission of oxygen or combustive air and an outer conduit cooperating with said inner conduit to define an annulus for receipt of said solid material and water, and .

generally inwardly projecting ribs disposed within said inner conduit extending generally adjacent to the inner surface of said inner conduit for establishing generally spiral motion to said oxygen or combustive air as it moves through said inner conduit, said ribs inclined relative to the longitudinal axis of the oxygen conduit or combustive air conduit and running in said inner conduit, wherein the inner conduit for the oxygen or the combustive air is a tube formed in several parts including lower and upper tube

portions which can glide into one another, and wherein the lower tube portion in the operative position is maintained fixed in the vortex burner and the upper tube portion is adjustable longitudinally and glides in the lower tube portion and the ribs are maintained between the upper tube portion and a fixation structure in said lower tube portion.

4,566,881

PROCESS AND APPARATUS FOR PRODUCING OXYGEN WITH A LOW PROPORTION OF ARGON FROM AIR

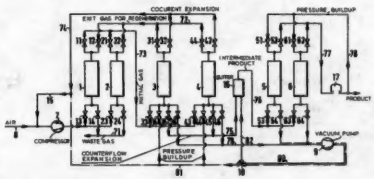
Ekkehard Richter; Karl Knoblauch, both of Essen; Rolf Schlegel, Gladbeck, and Werner Körbächer, Mühlheim, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,394

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402533

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—25 **20 Claims**



1. A process for producing oxygen with a low proportion of argon from air, comprising the steps of:

adsorbing oxygen from the air by allowing the latter to flow past a first adsorption unit;

desorbing the sorbed oxygen under formation of an intermediate gas enriched with oxygen and depleted of argon and including evacuating of the adsorption unit;

adsorbing nitrogen from the intermediate gas by allowing the latter to flow past a second adsorption unit to obtain a product gas further enriched with oxygen; and

desorbing the removed nitrogen from the second adsorption unit under formation of a by-product gas by evacuating the second adsorption unit, said second adsorbing and desorbing step defining a working cycle lasting twice as long as the working cycle defined by said first adsorbing and desorbing step wherein said evacuation step of said second adsorption unit is temporarily interrupted when said evacuating step of the first adsorption unit occurs.

12. An apparatus for producing oxygen with a low fraction of argon from air, comprising:

a first adsorption unit having at least two adsorbers for treating the air to provide an intermediate gas enriched with oxygen and depleted of argon, each of said adsorbers operating in a working cycle having an adsorption phase and a desorption phase;

a second adsorption unit having at least two adsorbers connected to said first adsorption unit for removing nitrogen from said intermediate gas so as to provide a further enrichment with oxygen, each of said adsorbers of said second adsorption unit operating in a working cycle which has an adsorption phase and a desorption phase and which lasts twice as long as the working cycle of said adsorbers of said first adsorption unit; and

a vacuum pump cooperating with each of said adsorbers of said first adsorption unit for evacuating said adsorbers of said first adsorption unit, and cooperating with each of said adsorbers of said second adsorption unit for regenerating said adsorbers of said second adsorption unit, said vacuum pump cooperating with said first and second adsorption units such that regeneration of said adsorbers of said second adsorption unit is temporarily interrupted when evacuation of one of said adsorbers of said first adsorption unit is provided.

4,566,882

FILTER FOR CLEANING GASES

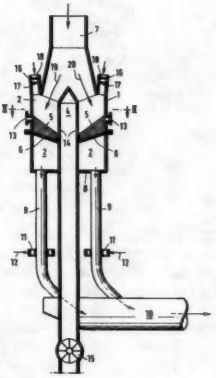
Harald Hoffmann, Much; Günter Henrich, Leverkusen, and Heinz-Dieter Waldhecker, Rösrath, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,568

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311108

Int. Cl.⁴ B03C *1/02;* **B01D** *46/36*

U.S. Cl. 55—100 **11 Claims**



1. A filter for cleaning gases comprising:

a housing,

a raw gas feed conduit communicating with said housing,

a relatively large clean gas discharge conduit positioned adjacent said housing,

partition wall means defining a plurality of filter chambers annularly disposed within said housing,

a bulk material layer composed of granular solids disposed in said chambers,

a plurality of relatively smaller clean gas discharge conduits, one being connected to each filter chamber and each discharging into said relatively large clean gas discharge conduit,

a centrally disposed channel in said housing,

said bulk material layer in said chambers being disposed in annular fashion about said channel, and

said channel having openings therein above said bulk material layer providing fluid communication with said chambers.

4,566,883

APPARATUS FOR GAS/LIQUID SEPARATION

Stephanus Paardekooper, and Johan J. B. Pek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1984, Ser. No. 586,482

Claims priority, application United Kingdom, Apr. 8, 1983, 8309633

Int. Cl.⁴ B01D *50/00*

U.S. Cl. 55—329 **7 Claims**

1. An apparatus for separating gas/liquid mixtures comprising:

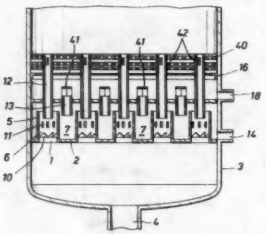
a vessel having a first transverse wall adjacent one end, an inlet means disposed in said one end for said gas/liquid mixture;

at least one swirl tube mounted in said first transverse wall for introducing a swirl flow in said gas/liquid mixture;

a second transverse wall disposed in said vessel above said first transverse wall, said first and second transverse walls confining an outer space around said at least one swirl tube;

a primary gas outlet tube disposed coaxially with said at least one swirl tube, said primary gas outlet tube passing through said second transverse wall;

at least one liquid discharge opening in the wall of said at least one swirl tube, said at least one discharge opening communicating with the enclosed space between said first and second transverse walls;



at least one secondary gas outlet, said at least one secondary gas outlet passing through the second transverse wall and establishing communication between the space above said second transverse wall and the space between said first and second transverse walls;

a demister mat positioned above said second transverse wall, said demister mat being formed of flow impinging material, said primary gas outlet tube extending substantially through an opening in said demister mat; and

an outlet formed in the portion of said primary gas outlet tube that extends into said demister mat and positioned and arranged for laterally discharging substantially all of the remaining liquid from the primary gas outlet tube into said demister mat.

4,566,884

VACUUM CLEANER BAG SUPPORT

John E. Jones, Greenville, and W. K. Glenn, III, Anderson, both of S.C., assignors to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 407,536, Aug. 12, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 605,008

Int. Cl.⁴ B01D *46/02*

U.S. Cl. 55—357 **2 Claims**

1. An upright vacuum cleaner having a chassis movably supported on the floor, a handle pivotally attached thereto and extending upwardly therefrom, a bag extending from said chassis upwardly adjacent said handle to an upper terminus thereof, and means for detachably securing said bag to said handle comprising:

a bag support having a connector portion and an extension from said connector portion,

cooperating means on said handle and on the connector portion of said bag support for removably securing said bag support to said handle,

said bag being formed at said upper terminus with a slot,

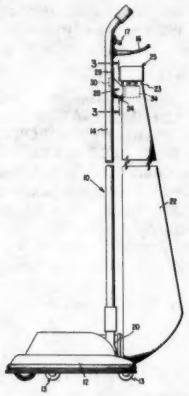
said bag support extension extending through said collecting bag slot to the interior of said bag,

a bag top support coextensive with the interior of said upper terminus of said bag and located between said bag upper terminus and said bag support extension,

said bag top support including a post slidably engaging said bag support extension,

a compression spring encircling said post and extending between said bag support extension and said bag top support, and

a cover on the exterior of said upper terminus of said bag of which cover the external shape and appearance is uninhibited by presence of any means connecting said cover with said handle.



4,566,885

GAS LIQUEFACTION PROCESS

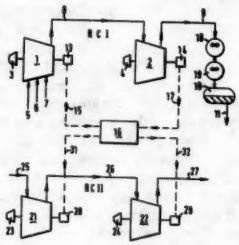
Frederik W. Haak, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 5, 1984, Ser. No. 657,856

Claims priority, application United Kingdom, Nov. 18, 1983, 8330762

Int. Cl.⁴ F25J *1/00*

U.S. Cl. 62—9 **8 Claims**



1. A method for liquefying a natural gas by cooling it under pressure in stages, comprising:

cooling the natural gas by means of at least two refrigerants having different compositions, said refrigerants being circulated by separate compressors in separate closed refrigeration systems;

driving a first compressor in a first one of the closed systems with a gas turbine and cooling the compressed refrigerant with ambient air;

driving, in addition to said first compressor, an electric generator and controlling said generator so that said turbine normally operates at substantially its designed load as the temperature of said ambient air varies; and

supplying the electric power generated to an auxiliary electric motor coupled to a second compressor in a second of said closed systems to deliver extra driving power to said second compressor.

4,566,886
PROCESS AND APPARATUS FOR OBTAINING PURE CO

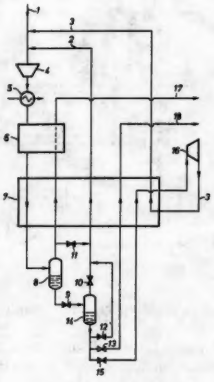
Rainer Fabian, Geretsried; Freimut Marold, Neubiberg, and Dieter Latzin, Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 600,059

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313171

Int. Cl.⁴ F25J *3/06*

U.S. Cl. 62—11 **19 Claims**



1. A process for obtaining purified carbon monoxide from a gaseous mixture consisting essentially of hydrogen and carbon monoxide (H_2-CO), comprising compressing the H_2-CO gaseous mixture; cooling the compressed gaseous mixture to condense a predominant portion of the carbon monoxide containing dissolved hydrogen; pressure reducing resultant condensed carbon monoxide to evolve dissolved H_2 in the gaseous phase thereby obtaining purified liquid carbon monoxide; recycling resultant evolved H_2 into said gaseous mixture; vaporizing a fraction of resultant purified carbon monoxide, engine expanding resultant vaporized fraction, and recycling resultant engine expanded fraction to said gaseous mixture, and withdrawing another fraction of said purified carbon monoxide as product.

4,566,887
PRODUCTION OF PURE NITROGEN

Ronald D. Openshaw, Cheshire, England, assignor to Costain Petrocarbon Limited, Manchester, United Kingdom

Filed Sep. 12, 1983, Ser. No. 531,252

Claims priority, application United Kingdom, Sep. 15, 1982, 8226290

Int. Cl.⁴ F25J *3/04*

U.S. Cl. 62—21 **17 Claims**

10. An apparatus for the production of nitrogen gas and liquid from air which comprises:

a distillation column;

means for introducing a flow of compressed air into said distillation column whereby a nitrogen-rich gas stream is recovered at the top of the distillation column and an oxygen-containing liquid stream is recovered at the bottom of the distillation column;

a valve means;

means for introducing at least a portion of said oxygen-containing liquid stream recovered from the bottom of the distillation column to the valve means for expansion therein;

means for effecting an indirect heat exchange between a portion of the nitrogen-rich gas stream recovered from the top of the distillation column and the expanded oxygen-containing liquid stream recovered from the value means whereby the expanded oxygen-containing liquid stream is evaporated and the portion of the nitrogen-rich gas stream recovered from the top of the distillation column is condensed and returned to the distillation column as reflux and a portion thereof optionally recovered as a liquid nitrogen product;

a work expansion means;

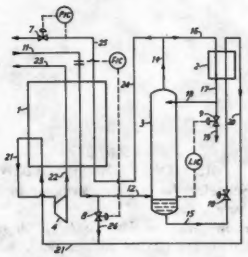
means for passing the evaporated oxygen-containing liquid stream through the work expansion means;

means for passing the work-expanded oxygen-containing stream in indirect heat exchange with the flow of compressed air to be introduced into the distillation column to refrigerate the flow of compressed air, and recovering the work-expanded oxygen-containing stream;

means for recovering a portion of the nitrogen-rich gas stream recovered at the top of the distillation column as a gaseous nitrogen product; and

means designed for regulating the output of nitrogen gas and liquid in accordance with a variable demand for nitrogen gas whereby the output of liquid nitrogen is increased in periods of reduced demand for nitrogen gas, said means including:

means for periodically diverting a portion of the flow of compressed air to be introduced into the distillation column, combining the diverted compressed air stream with the evaporated oxygen-containing liquid stream, passing the combined stream through the work expansion means,



passing the combined work-expanded stream in indirect heat exchange with the flow of compressed air to be introduced into the distillation column to refrigerate the compressed air, and recovering the combined stream.

14. An apparatus for the production of nitrogen gas and liquid from air which comprises:

a distillation column;

means for introducing a flow of compressed air into said distillation column whereby a nitrogen-rich gas stream is recovered at the top of the distillation column and an oxygen-containing liquid stream is recovered at the bottom of the distillation column;

a valve means;

means for introducing at least a portion of said oxygen-containing liquid stream to the valve means for expansion therein;

means for effecting an indirect heat exchange between a portion of the nitrogen-rich gas stream recovered from the top of the distillation column and at least a portion of the oxygen-containing liquid stream recovered from the bottom of the distillation column whereby the oxygen-containing liquid stream is evaporated and the portion of the nitrogen-rich gas stream recovered from the top of the distillation column is condensed and returned to the distillation column as reflux and a portion thereof optionally recovered as a liquid nitrogen product;

a first work expansion means;

means for passing the evaporated oxygen-containing stream through the first work expansion means;

means for passing the work-expanded oxygen-containing liquid stream in indirect heat exchange with the flow of compressed air to be introduced into the distillation column to refrigerate the flow of compressed air, and recovering the work-expanded oxygen-containing stream;

means for recovering a portion of the nitrogen-rich gas stream recovered at the top of the distillation column as a gaseous nitrogen product; and

means designed for regulating the output of nitrogen gas and liquid in accordance with a variable demand for nitrogen gas whereby the output of liquid nitrogen is increased in periods of reduced demand for nitrogen gas, said means including:

means for periodically diverting a portion of the flow of compressed air to be introduced into the distillation column, passing the diverted stream of compressed air through a second work expansion means, combining the diverted stream of compressed air which has been work-expanded with the work-expanded oxygen-containing stream and passing the combined stream in indirect heat exchange with the flow of compressed air to be introduced into the distillation column to refrigerate the flow of compressed air, and recovering the combined stream.

4,566,888

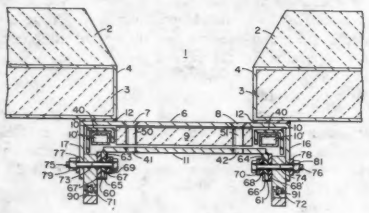
BUSHING CONSTRUCTION

William L. Schaefer, Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 635,018, Jul. 27, 1984, abandoned. This application Jun. 5, 1985, Ser. No. 741,377

Int. Cl.⁴ C03B *37/09*

U.S. Cl. 65—1 **18 Claims**



1. A bushing assembly comprising a flat precious metal plate being provided with at least one hole therein, an insulation member positioned below said precious metal plate and having at least one hole therein surrounding the hole in said precious metal plate, a frame member surrounding said insulation member and having means to circulate cooling fluid therethrough, an insulator covering the upper surface and at least a portion of the sides of said frame, a support plate positioned below said insulation member and said frame and having at least one hole therein communicating with the holes of said precious metal plate and said insulation member, means to electrically connect said precious metal plate to a power source and means to attach said assembly to a source of molten glass with the precious metal plate surface facing said molten glass source.

4,566,889

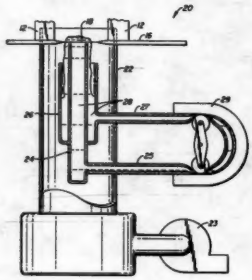
PROCESS OF FABRICATING A PORTION OF AN OPTICAL FIBER CAPABLE OF REFLECTING PREDETERMINED WAVELENGTH BANDS OF LIGHT

Donald C. Schmadel, Jr., Kensington, Md., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 546,608, Oct. 28, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 672,540

Int. Cl.⁴ C03C *25/02, 25/06*

U.S. Cl. 65—3.2 **20 Claims**



1. A process of fabricating gratings in an optical fiber comprising:

removing the outer layers of an optical fiber to a depth wherein evanescent waves are encountered;

coating the fiber with a photoresist;

exposing the photoresist to interfering beams of light having a predetermined spatial separation so as to fabricate a plurality of exposure peaks in the photoresist;

developing the photoresist;

removing the soluble portions of the photoresist; and

etching the optical fiber with an ion beam.

4,566,890

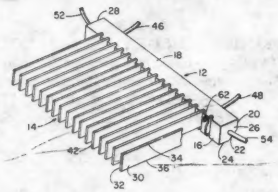
SELF PURGING FIN COOLER

Jonathan E. Hostler, Verona, and Richard P. Beaver, Library, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 17, 1984, Ser. No. 682,401

Int. Cl.⁴ C03B *37/02*

U.S. Cl. 65—12 **12 Claims**



1. A self purging fin cooler useable with a glass filament forming bushing, said self purging fin cooler comprising:

a fin cooler header block having a coolant liquid flow channel, a separate cleaning liquid flow channel, and a plurality of spaced, parallel cooling fins affixed at first ends to a front face of said header block and extending outwardly therefrom;

means to flow coolant liquid through said coolant liquid flow channel and means to flow cleaning liquid to said cleaning liquid flow channel;

cleaning liquid distribution passages extending from said cleaning liquid flow channel and terminating at said front face of said header block with one of said distribution passages

terminating between each two adjacent ones of said cooling fins;

a removable spray nozzle secured in each of said liquid distribution passages at said front face of said header block; and

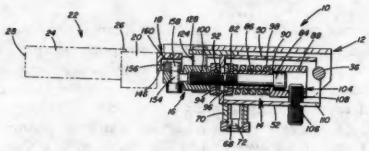
means to intermittently supply cleaning liquid at high pressure to said spray nozzles for impingement against said cooling fins.

4,566,891

FIN COOLER CLAMP

Thomas J. Briar, Trafford, and William H. Retsch, Castle Shannon, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1984, Ser. No. 686,169
Int. Cl.[4] C03B 37/02
U.S. Cl. 65—12 20 Claims



1. A fin cooler clamp assembly useable to releasably and adjustable secure a fin cooler having a plurality of spaced cooling fins attached at first ends to an elongated header block beneath an elongated glass fiber forming bushing, said fin cooler clamp assembly comprising:

a fin support bracket attachable to a bushing frame generally beneath the bushing, said fin support bracket including a generally inverted U-shaped channel;

a fin adjusting housing releasably positionable within said U-shaped channel;

a fin attaching block attached to a forward portion of said fin adjusting housing; and

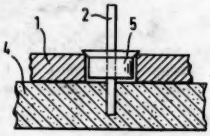
a fin block attached to said fin attaching block, said header block being secured to said fin block.

4,566,892

METHOD FOR FORMING GLASS TO METAL SEALS IN STRUCTURAL MEMBERS

Gerhard Ertel, Tienfenbach, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,187
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337037
Int. Cl.[4] C03C 29/00
U.S. Cl. 65—59.24 16 Claims



1. A method of locating a conductor in a bore through a metallic structural member, with a glass-to-metal seal between the interfacing surfaces of the bore, glass and conductor, the method comprising the steps of:

(a) providing a glass bead of a diameter less than the bore through the metallic structural member;

(b) surrounding the conductor with the glass bead;

(C) keeping the glass bead from touching the metallic structural member by decreasing the diameter of the bore at the location spaced from one side of the metallic structural member to a diameter less than that of the bead;

(d) orienting the metallic structural member with said one side facing downwardly;

(e) inserting the glass bead in the bore;

(f) abutting the bead with the reduced diameter portion of the bore;

(g) performing steps (a)–(f) to form an assembly of the metallic structural member, glass bead and conductor;

(h) heating at least the glass bead of the assembly to a temperature sufficient to fuse the bead to the surface of the bore; and

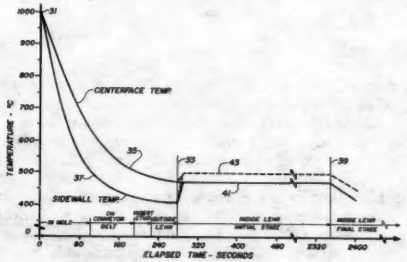
(i) allowing the glass to cool so as to form the glass to metal seal.

4,566,893

METHOD FOR FABRICATING A GLASS CRT PANEL

Maxwell M. Hopkins, Kendall Park, and Arthur Miller, West Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 3, 1984, Ser. No. 657,085
Int. Cl.[4] C03B 25/00
U.S. Cl. 65—69 12 Claims



1. Method for fabricating a glass panel comprising a viewing window and peripheral sidewalls for a cathode-ray tube, which panel exhibits high compressive surface stress and low dimensional change when reheated from room temperatures to temperatures above 450° C. and then cooled to room temperature, said method comprising

A. forming said panel from a gob of molten glass,

B. permitting said panel to cool to temperature within an annealing range which will subsequently produce minimum compaction in said window whereby substantial stresses with relatively long relaxation times are induced in said window,

C. maintaining the window of said panel during the initial annealing stage for a prescribed period of time at about said temperatures within said annealing range that produce minimum compaction in said window, said combination of time and temperature being sufficient for relieving stresses with relatively short relaxation times while retaining stresses with relatively long relaxation times,

D. and then cooling said panel to room temperature.

4,566,894

DEFLECTOR ADJUSTMENT FOR A GLASSWARE FORMING MACHINE

Constantine W. Kulig, Windsor; Charles M. Kingsbury, and Bruce R. Beckwith, both of Unionville, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

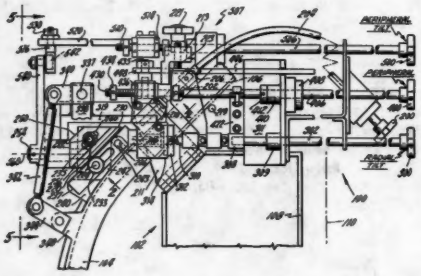
Continuation of Ser. No. 472,391, Mar. 4, 1983, abandoned. This application May 20, 1985, Ser. No. 736,514
Int. Cl.[4] C03B 7/14
U.S. Cl. 65—304 2 Claims

2. In a glassware forming machine of the type including a plurality of blank molds, and for each blank mold a glass gob

delivery system incorporating a chute, a trough, and a deflector extending along a deflector axis for guiding glass gobs to said blank mold, and further including means for oscillating said deflector about a first axis along a predetermined arcuate path, the improvement comprising:

a pivot block fixed to said deflector near an infeed end thereof;

radial adjusting means for translating the pivot block and thereby translating said deflector within a radial plane substantially intersecting said deflector axis and said first axis;



radial tilt adjusting means for pivotally adjusting the position of an outfeed end of said deflector around a pivot point near the infeed end thereof, within the radial plane;

peripheral adjusting means for translating said pivot block along an arc in a plane essentially perpendicular to the deflector axis; and

peripheral tilt adjusting means for rotating said pivot block around an axis essentially perpendicular to its deflector axis and the radial, peripheral, and peripheral tilt adjusting means comprise mechanisms remotely operable from the glass gob delivery system for adjusting the position and orientation of the pivot block.

4,566,895

MOLDS USED FOR BLOWING GLASS ARTICLES

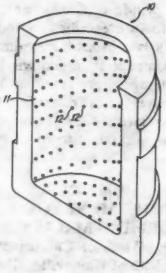
Masayoshi Kusakabe, Shiga, Japan, assignor to Nippon Electric Glass Company, Limited, Otsu, Japan

Continuation of Ser. No. 605,786, May 1, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 745,381

Claims priority, application Japan, May 4, 1983, 58-77547

Int. Cl.⁴ C03B *9/347*

U.S. Cl. 65—319 **6 Claims**



1. A metallic mold for blowing glass article which consists of a water- and steam-impermeable met; wall having an inner molding surface and a multiplicity of small water-retaining and steam-impermeable blind holes mechanically formed in the metallic wall and distributed over the entire inner molding surface, each one of the blind holes extending from the inner surface to a bottom of the hole in the metallic wall.

4,566,896

METHOD AND MEDIA FOR STIMULATING GROWTH IN FOLIAGE PLANTS

William C. Firth, Jr., Robbinsville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 201,923, Oct. 29, 1980, Pat. No. 4,321,076, which is a division of Ser. No. 109,794, Jan. 7, 1980, Pat. No. 4,274,860, which is a continuation-in-part of Ser. No. 924,146, Jul. 13, 1978, abandoned. This application Nov. 6, 1981, Ser. No. 318,741

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.⁴ C05F *11/02*

U.S. Cl. 71—24 **4 Claims**

1. In a conventional potting media for stimulating growth of foliage plants, the improvement which comprises, the presence of from 0.1 percent to 10 percent by volume of a humate, said humate being one which has in its composition a carbon to hydrogen ratio (weight to weight) of from 9.5–17.5:1.0; a carbon to oxygen ratio of 1.0–2.3:1.0; an aluminum content of 2.8 to 8.4 percent by weight; a titanium content of 0.5 to 3.5 percent by weight and a calcium content of less than 0.5 percent by weight; said humate being present in the potting media in an amount such that the potting media is effective to stimulate the growth of foliage plants selected from the group consisting of Calethea, Chamaedorea and Philodendron.

4,566,897

DIPHENYL ETHER DERIVATIVES AND HERBICIDES CONTAINING SAME

Takeo Yoshimoto; Akira Hosono; Joh Miki; Yasunobu Funakoshi; Takashi Fujita, and Yoshikata Hojo, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

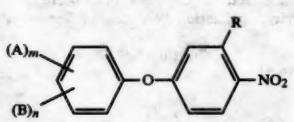
Division of Ser. No. 287,654, Jul. 28, 1981, Pat. No. 4,515,628, which is a continuation of Ser. No. 91,858, Nov. 6, 1979, abandoned. This application Mar. 15, 1984, Ser. No. 589,795

Claims priority, application Japan, Nov. 8, 1978, 53-136769

Int. Cl.⁴ A01N *43/46*; C07D *223/02*

U.S. Cl. 71—88 **4 Claims**

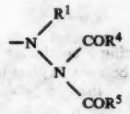
1. A diphenyl ether compound represented by the formula I,



(I)

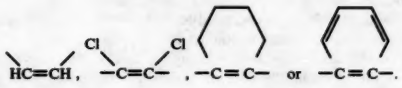
wherein A and B are each selected from the group consisting of a chlorine atom, a fluorine atom, —CH_3 and —CF_3; m and n each represent an integer 0~3 and $m+n=0\sim3$;

R represents

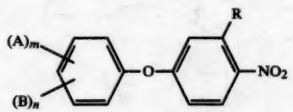


wherein R^1 represents hydrogen atom, —CH_3, C_2H_5 or —C_3H_7(n);

R^4 and R^5 together represent —$(CH_2)_2$—, —$(CH_2)_3$—, —$(CH_2)_4$—,



4. A herbicidal composition containing, as an active ingredient a herbicidally effective amount of a diphenyl ether compound represented by the formula I,



I

wherein A, B, m, n and R are as defined in the formula I of claims 1, 2 or 3 and also containing an inert herbicidal carrier.

4,566,898

HERBICIDAL SULFONAMIDES

James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 7, 1984, Ser. No. 648,065

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.[4] C07D *251/42, 251/16;* A01N *43/66*

U.S. Cl. 71—93 5 Claims

1. A compound selected from 4-chloro-2-[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)aminocarbonyl]aminosulfonyl]benzoic acid (1-methylethyl)ester and its agriculturally suitable salts.

4,566,899

SELECTIVE HERBICIDAL BENZYLCARBAMOYLPYRIDINE DERIVATIVES

Dominique Ambrosi, Charbonnieres Les Bains, and Francois de Reinach Hirtzbach, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

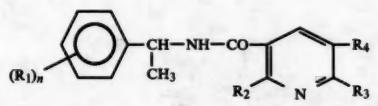
Filed Dec. 13, 1983, Ser. No. 560,922

Claims priority, application France, Dec. 13, 1982, 82 21078

Int. Cl.[4] C07D *213/82, 401/06;* A01N *43/40, 43/64*

U.S. Cl. 71—93 9 Claims

1. A benzylcarbamoylpyridine derivative of the formula



(I)

or an agriculturally acceptable salt thereof wherein: R_1 represents a halogen atom, and alkyl radical containing from 1 to 6 carbon atoms, optionally substituted by one or more halogen atoms, or an alkoxyl radical containing from 1 to 4 carbon atoms;

R_2 and R_3, which are identical or different, represent an alkyl radical containing from 1 to 3 carbon atoms, an alkoxy radical containing from 1 to 4 carbon atoms or an alkoxyalkyl radical containing from 2 to 8 carbon atoms;

R_4 represents a radical selected from the group consisting of alkanoyl radicals containing from 1 to 6 carbon atoms, benzoyl radicals optionally substituted by one or more halogen atoms, azidomethyl radicals, alkoxy-carbonylmethyl radicals containing from 3 to 8 carbon atoms, hydroxyalkyl radicals containing from 2 to 5 carbon atoms, halogenalkyl radicals containing from 2 to 5 carbon atoms, straight or branched alkyl radicals containing from 1 to 4 carbon atoms optionally substituted by a triazolyl radical, alkynyloxyalkyl radicals containing from 4 to 8 carbon atoms, or a vinyl radical;

n is an integer from 0 to 5 inclusive, and when n is greater than 1, said R_1 substituents may be identical or different.

5. A herbicidal composition comprising a herbicidally effective amount of at least one compound according to claim 1, as the active ingredient and an agriculturally acceptable carrier or surface active agent.

4,566,900

ANILINE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Peter Plath, Ludwigshafen; Ulrich Schirmer, Heidelberg; Gernot Reissenweber, Ludwigshafen; Bruno Wuerzer, Otterstadt, and Guenter Retzlaff, Roemerberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

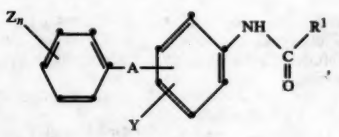
Filed Dec. 1, 1982, Ser. No. 445,702

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148594

Int. Cl.[4] C07C *155/02, 83/10;* A01N *37/00, 37/44*

U.S. Cl. 71—100 8 Claims

1. An aniline derivative of the formula

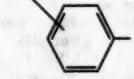


(I)

where R^1 is alkoxy, alkylthio or unsubstituted alkyl, halogen-substituted alkyl or C_1–C_4-alkoxy-substituted alkyl, each of which is of no more than 4 carbon atoms, or is cycloalkyl of 3 to 6 carbon atoms or the radical

where R^2 and R^3 independently of one another are each hydrogen, alkyl or alkoxy, each of no more than 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms, Y is hydrogen, halogen, methyl, methoxy or trifluoromethyl, A is an alkylene chain of 2 to 9 carbon atoms which contains a carbonyl group or a carbinol group of the formula

and can be substituted by methyl, Z is hydrogen, halogen, alkyl, alkoxy, haloalkyl or haloalkoxy, each of no more than 6 carbon atoms, or phenyl or phenoxy, and n is 1, 2 or 3, and the radical



can be replaced by naphthyl which is unsubstituted or substituted by halogen, or by alkyl or alkoxy, each of no more than 4 carbon atoms.

5. A herbicide containing inert additives and from 0.1 to

95% by weight of an aniline derivative of the formula I as claimed in claim 1.

4,566,901

NOVEL OXIME ETHERS, THE PREPARATION THEREOF, COMPOSITIONS CONTAINING THEM AND THE USE THEREOF

Henry Martin, Allschwil, and Urs Fricker, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

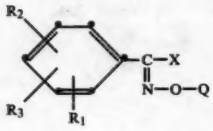
Filed Apr. 29, 1983, Ser. No. 490,055

Claims priority, application Switzerland, May 6, 1982, 2804/82

Int. Cl.[4] A01N *37/34*; C07C *121/66*

U.S. Cl. 71—105 19 Claims

1. An oxime ether of the formula I



(I)

R_1 is hydrogen, halogen C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkylsulfonyl or nitro,

R_2 and R_3 are each hydrogen, halogen C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_4 haloalkyl,

Q is $—CH_2CONH_2$ or $—CH(CH_3)CONH_2$; and

X is a fluorinated C_1–C_3 alkyl radical, which may also contain chlorine.

15. A composition for protecting cultivated plants from damage caused by a herbicidal haloacetanilide, thiocarbamate, 1,2,4-triazinone or dinitroaniline, which composition contains an effective amount of an oxime ether of claim 1, together with an inert carrier.

4,566,902

PROCESS FOR REMOVING SULFUR DURING MELTING OF PIG IRON

Horst Sulzbacher, Leoben, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Apr. 30, 1984, Ser. No. 605,282

Claims priority, application Austria, May 4, 1983, 1646/83

Int. Cl.[4] C22B *1/10*

U.S. Cl. 75—26 8 Claims

1. A process for removing sulfur during the melting of pig iron within a fluidized layer comprising introducing a desulfurating agent into the fluidized layer of sulfur-containing coal and pig iron, the desulfurating agent comprising a first grain size of 0.5 to 5 mm to selectively remove sulfur from the coal in the fluidized layer and a second grain size of 5 to 50 mm which passes through the fluidized layer to contact and thereby desulfurize the resulting molten slag.

4,566,903

METHOD FOR THE PYROMETALLURGICAL TREATMENT OF FINE GRAINED SOLIDS TO PRODUCE MOLTEN PRODUCTS

Gerhard Melcher; Friedrich Megerle, both of Cologne, and Wolfgang Wuth, Berlin, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,122

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335859

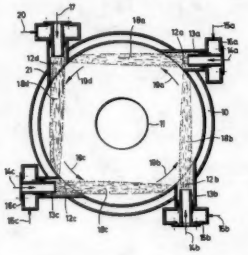
Int. Cl.[4] C22B *15/00*

U.S. Cl. 75—26 7 Claims

1. In a method for the pyrometallurgical treatment of fine grained products which yield molten products at elevated temperatures upon treatment with oxygen which includes the steps of:

mixing said fine grained product with an oxygen-containing gas to form a suspension, and

blowing said suspension through a nozzle into a vertical melting cyclone where the solids are caused to react and are melted into a high mass flow velocity and high temperature stream, the improvement which comprises:



injecting said stream into said melting cyclone as a focused open particle jet having a mass flow velocity greater than 50 kg/m^2-sec and a linear velocity greater than 35 m/sec such that the particle jet forms a generally horizontal secant to the cyclone circumference in spaced relation to the inside wall of said cyclone; and

igniting said particle stream as it enters said cyclone.

4,566,904

PROCESS FOR THE PRODUCTION OF IRON

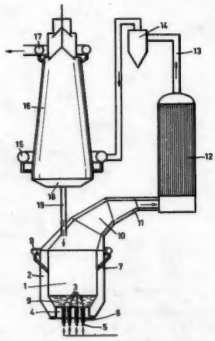
Ludwig von Bogdandy, Oberhausen-Sterkrade, and Karl Brotzmann, Sulzbach-Rosenberg, both of Fed. Rep. of Germany, assignors to Klockner CRA Technologie GmbH, Duisburg, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,959

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318005

Int. Cl.[4] C21B *13/14*

U.S. Cl. 75—38 18 Claims



1. A process for producing iron from a compound containing iron and oxygen, said process comprising the steps of

(1) introducing a compound containing iron and oxygen into a reduction vessel,

(2) adding a cooled reduction gas to said reduction vessel to partially reduce said compound therein,

(3) transferring said partially-reduced compound obtained in step (2) from said reduction vessel to a melting crucible,

(4) adding a carbon-containing fuel and at least one oxygen-containing gas to said melting crucible,
(5) completely reducing and melting said partially-reduced compound in said melting crucible to form an iron melt,
(6) producing a reaction gas in said melting crucible,
(7) partially afterburning said reaction gas to obtain an after-burned gas and to generate heat,
(8) transferring said heat generated in step (7) to said iron melt,
(9) reducing and cooling said after-burned gas obtained in step (7) with a reducing agent to obtain the cooled reduction gas used in step (2), and
(10) removing portions of the iron melt from said melting crucible.

4,566,905

HIGH DENSITY BORON NITRIDE-CONTAINING SINTERED BODY FOR CUTTING TOOL AND A METHOD OF PRODUCING THE SAME

Tamotsu Akashi, Chita, and Masatada Araki, Handa, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan

Filed Sep. 20, 1983, Ser. No. 533,943
Claims priority, application Japan, Oct. 1, 1982, 57-172696
Int. Cl.[4] B22F *3/14*
U.S. Cl. 75—244 2 Claims

1. A high density boron nitride-containing sintered body for use as a cutting tool, consisting essentially of 60–95% by volume of high density boron nitride and 40–5% by volume of metal alone or in admixture with a ceramic, said high density boron nitride consisting of 60–95% by volume of cubic boron nitride and 40–5% by volume of wurtzite-structured boron nitride, said cubic boron nitride having an average particle size of at least 5 times that of said wurtzite-structured boron nitride.

4,566,906

ANTI-FOULING PAINT CONTAINING LEACHING AGENT STABILIZERS

Vincent D. McGinniss, Delaware, and Richard J. Dick, Columbus, both of Ohio, assignors to Chugoku Marine Paints (USA) Inc., New York, N.Y.

Filed Apr. 19, 1984, Ser. No. 602,202
Int. Cl.[4] C09D *5/14*
U.S. Cl. 106—15.05 6 Claims

1. In a marine anti-fouling coating composition of a thermoplastic binder, an organic solvent, a tin anti-fouling agent, a copper anti-fouling agent, and a water-soluble leaching agent, the improvement comprising, as said leaching agent,
a water-sensitive, solvent-soluble, non-cross-linked oligomer or polymer having an acid number of below about 50 and a χ value of between about 0.1 and 0.3 in an amount sufficient to increase can stability of the coating composition.

4,566,907

COLOR-DEVELOPING INK FOR NON-CARBON COPYING PAPER

Nobuhiro Kagota, Takasago, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 579,880
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—21 5 Claims

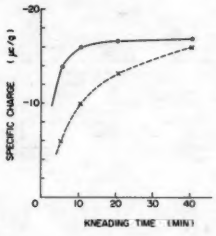
1. A color-developing ink for non-carbon copying paper, characterized by containing at least one color developer selected from the group consisting of phenolic resins, aromatic carboxylic acids and metal salts thereof as well as a higher chain dialkyl ether having total carbon atoms of 10 to 40.

4,566,908

AZOIC PIGMENTS HAVING A SILICA CORE

Kaname Nakatani, Kawasaki; Nobuhiro Miyakawa, Abiko; Teruaki Higashiguchi, Tokyo, and Syoji Nakagama, Suita, all of Japan, assignors to Mita Industrial Company, Limited, Osaka, Japan

Filed Feb. 24, 1984, Ser. No. 583,424
Int. Cl.[4] C09C *1/28, 3/12*
U.S. Cl. 106—308 N 10 Claims



1. An azoic pigment having a silica core comprising a core of a fine powder of silica having a particle diameter of not more than 10 microns and a coating of a mono- or polyazoic dye chemically bound to the surface of the silica core through an aminosilane coupling agent.

4,566,909

HYDROLYZED YAM STARCH FLOCCULANTS

Raymond N. Yong, Beaconsfield, and Amar J. Sethi, Baie D'Urfe, both of Canada, assignors to Suncor, Inc., Toronto, Canada

Division of Ser. No. 562,353, Dec. 16, 1983, Pat. No. 4,507,209. This application Nov. 19, 1984, Ser. No. 672,515
Int. Cl.[4] C08B *30/12*
U.S. Cl. 127—33 3 Claims

1. A composition comprising a hydrolyzed yam starch obtained by the aqueous hydrolysis of yam starch in the presence of about 10 to about 30 gms per 100 gms of starch of insoluble metal salts formed in situ, wherein the salts employed during the hydrolysis to form said insoluble salts are the soluble salts of metals selected from the group consisting of sodium, potassium, ammonium, magnesium, calcium, and aluminum, and the respective anions of said soluble salts are selected from the group consisting of sulfates, acetates, chlorides, nitrates, chlorates, bromides, iodides, thiocyanates, and phosphates, and wherein the yam starch is obtained from a yam selected from the group consisting of Cocoa Yam, Negro Yam and Sweet Yam.

4,566,910

STARCH PHOSPHATES AND AMPHOTERIC STARCH PHOSPHATES

E. Daniel Hubbard, West Liberty; Richard D. Harvey, and Mark L. Hogen, both of Muscatine, all of Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Nov. 12, 1982, Ser. No. 441,388
Int. Cl.[4] C08B *31/00*
U.S. Cl. 127—70 32 Claims

1. A process for preparing a starch derivative which comprises:
(1) treating an aqueous thinned starch paste with an alkali or alkaline material to give an alkaline pH,
(2) reacting with the alkaline starch paste while maintaining an alkaline pH a phosphate salt at a temperature of about 45° to 95° C. for a period of not more than about 120 minutes, and
(3) recovering a starch phosphate paste.

4,566,911
METHOD FOR CLEANING ARTICLE BY SCRUBBING WITH CLEANING ROLL

Yogi Tomita, Ibaraki; Hisashi Yamamoto, Toyonaka, and Susumu Kitagawa, Neyagawa, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

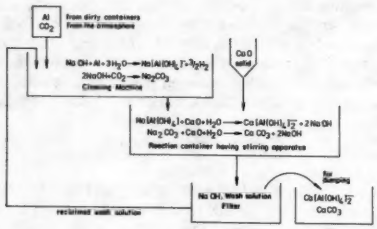
Filed Jul. 5, 1983, Ser. No. 510,988
Claims priority, application Japan, Jul. 5, 1982, 57-117432
Int. Cl.[4] B08B *1/04*
U.S. Cl. 134—6 6 Claims

1. A method for thorough cleaning of a finely finished surface of an article of glass or metal by removing cuttings, shavings, turnings, abrasive grains and fine particles from said surface, comprising scrubbing said surface by means of a cleaning roll having a surface layer of polyvinyl acetal porous elastic material having a porosity of 85% to 95%, an average pore opening of 10 to 200 μm, and a 30% compression stress, at a water content of 100% based on the dry weight of the material, of 15 to 150 g/cm^2, whereby said surface is thoroughly cleaned of even fine particles without causing damage to the fine finish of said surface.

4,566,912
METHOD OF REGENERATING ALKALI-CONTAINING WASH SOLUTIONS UTILIZED FOR CLEANING CONTAINERS

Siegbert Borg, Bingen, Fed. Rep. of Germany, assignor to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,449
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317571
Int. Cl.[4] B08B *7/04*
U.S. Cl. 134—13 8 Claims



1. A method of regenerating wash solution for permanently maintaining wash force thereof and which contains sodium hydroxide and/or potassium hydroxide, and which is used during the mechanical cleaning of containers such as bottles; the wash solution contains, as impurities, dissolved aluminum, copper, or other heavy metals in the form of zinc, iron, nickel, or lead, which originated from the containers, and carbonates resulting during the cleaning, and organic substances which adhere to the containers; said method comprising the steps of:

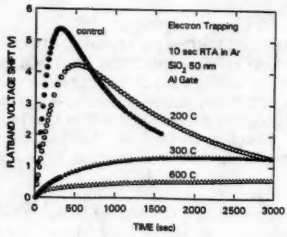
adding directly to said impure wash solution at least one calcium compound in the form of one of the group consisting of solid calcium compounds and aqueous suspensions thereof, to thus form at least one precipitate to remove said impurities although maintaining wash force by having free alkali available therein; and

separating said precipitate from said wash solution especially removing salts therefrom to produce regenerated wash solution.

4,566,913
RAPID THERMAL ANNEALING OF SILICON DIOXIDE FOR REDUCED ELECTRON TRAPPING

Marc H. Brodsky, Mt. Kisco, and Zeev A. Weinberg, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1984, Ser. No. 636,042
Int. Cl.[4] H01L *21/263;* B23K *27/00*
U.S. Cl. 148—1.5 4 Claims



1. A process for enhancing electronic properties of a thin silicon dioxide insulating layer on an integrated circuit wafer characterized by

(a) positioning the wafer inside an enclosure;

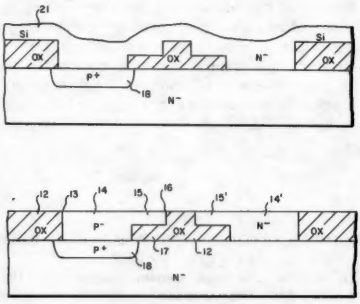
(b) charging said enclosure with a flowing inert gas; and

(c) quickly heating the wafer by radiation heating to a temperature range 300 C–800 C for a duration 3–15 seconds.

4,566,914
METHOD OF FORMING LOCALIZED EPITAXY AND DEVICES FORMED THEREIN

John H. Hall, San Jose, Calif., assignor to Micro Power Systems, Inc., Santa Clara, Calif.

Filed May 13, 1983, Ser. No. 494,124
Int. Cl.[4] H01L *21/20, 21/265*
U.S. Cl. 148—1.5 12 Claims



1. A method for forming an isolated integrated circuit structure comprising the sequential steps of:

providing a silicon body having a surface;

forming an insulatory layer on the surface having at least one aperture exposing a portion of the surface of said body;

partially etching away the insulatory layer in at least one

area adjacent to at least one of said apertures in said insulatory layer, said aperture and adjacent area together comprising a defined circuit area;

depositing a layer of silicon on the surface such that the deposit on the exposed area of silicon is epitaxial single crystal silicon; and

removing deposited silicon outside of said defined circuit area.

4,566,915

PROCESS FOR PRODUCING AN AGE-HARDENING COPPER TITANIUM ALLOY STRIP

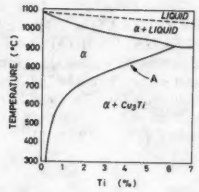
Kazuo Ikushima; Yoshio Itoh, and Toshiaki Ishihara, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Nov. 13, 1984, Ser. No. 670,930

Claims priority, application Japan, Nov. 22, 1983, 58-220139

Int. Cl.⁴ C22F *1/08*

U.S. Cl. 148—11.5 C **12 Claims**



1. A process for producing an age-hardened copper titanium alloy strip, comprising:

preparing a copper titanium alloy melt;

casting said melt;

hot-working the cast alloy;

annealing the worked alloy at a temperature which is lower than a solid solution boundary temperature and lower than a recrystallization temperature; and

subjecting the annealed alloy to solution heat treatment, said solution heat treatment being terminated by water-cooling before or approximately as soon as a precipitated secondary phase has dissolved in a master phase and forms a solid solution with the master phase.

4,566,916

LOW-HYDROGEN, LOW-NITROGEN, LOW-OXYGEN WELDING FLUX

Kyoichi Nagano; Hiroshi Naganuma; Koichi Shinada; Motonori Tamura, and Shigenobu Soneda, all of Sagamiharashi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,011

Claims priority, application Japan, Mar. 13, 1984, 59-47585

Int. Cl.⁴ B23K *35/34*

U.S. Cl. 148—26 **8 Claims**

1. A welding flux suitable for submerged arc welding, which comprises CaO, MgO, Al_2O_3 and SiO_2, wherein the proportions of the above four components to the total amount thereof taken as 100% fall in the following respective ranges:

CaO: 10 to 60%

MgO: Not more than 30%

Al_2O_3: 20 to 70%

SiO_2: 5 to 40%

and wherein the total amount of said four components accounts for not less than 35% of the total weight of said flux less any CO_2 component thereof, said flux further contains CaF_2 in an amount of from 25 to 60% of the total weight of said flux less the CO_2 component thereof, the basicity (B) of said flux is not less than 1.0 calculated in accordance with the formula (I)

$$B = 6.50N_{BaO} + 6.05N_{CaO} + 4.8N_{MnO} + 4.0N_{MgO} + \quad \text{(I)}$$

-continued

$$3.4N_{FeO} + 5.1N_{CaF_2} + 0.3N_{ZrO_2} - 0.2N_{Al_2O_3} - 2.2N_{TiO_2} - 6.3N_{SiO_2}$$

wherein N denotes the mol percentage of the respective components,

said flux contains both a fused substance and a non-fused substance, said fused substance has undergone a water-cooling treatment, and the basicity (B) of said fused substance calculated in accordance with the formula (I) is not more than 2.7.

4,566,917

LOW MAGNETOSTRICTION AMORPHOUS METAL ALLOYS

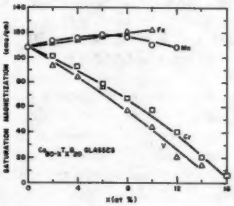
Robert C. O'Handley, Bedford Hills, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 133,775, Mar. 25, 1980, Pat. No. 4,482,400. This application Feb. 28, 1983, Ser. No. 470,863

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.⁴ C22C *19/07*

U.S. Cl. 148—31.55 **4 Claims**



1. A magnetic alloy that is at least about 80 percent glassy and consists essentially of a composition having the formula $(Co_{1-x}T_x)_{100-b}(B_{1-y}Y_y)_b$, where T is at least one of chromium and vanadium, Y is at least one of carbon, silicon, phosphorous and germanium, x ranges from about 0.05 to 0.25, y ranges from about 0 to 0.75, and b ranges from about 14 to 28 atom percent, plus incidental impurities, said alloy having a value of magnetostriction of about -6×10^{-6} to 4×10^{-6} and a saturation induction of about 0.2 to 1.0T.

4,566,918

UTILIZING INTERDIFFUSION OF SEQUENTIALLY DEPOSITED LINKS OF HGTE AND CDTE

Stuart J. C. Irvine, Cradley; John B. Mullin, West Malvern, and Jean Giess, Colwall, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Great Britain

Filed Aug. 16, 1984, Ser. No. 641,483

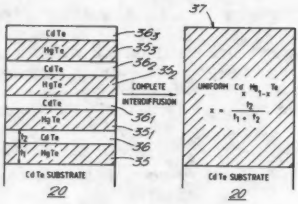
Claims priority, application United Kingdom, Sep. 13, 1983, 8324531

Int. Cl.⁴ H01L *21/36, 21/477*

U.S. Cl. 148—175 **13 Claims**

1. A method of growing a layer of the ternary alloy $Cd_xHg_{1-x}Te$ onto a substrate comprises the steps of providing an atmosphere of mercury vapour at a required temperature and pressure inside a vessel; controlling the temperature of the substrate independently of the vessel temperature; providing separate supplies of a cadmium compound, a tellurium compound, and a dilutant gas into the vessel to grow a layer of HgTe t_1 thick and a layer of CdTe t_2 thick in either order; switching the supply of cadmium compound to the substrate on and off to grow a layer of CdTe and of HgTe, the combined thickness t_1+t_2 of the two layers being not greater than 0.5 μm thick, the arrangement being such that the Cd compound

decomposes preferentially with the Te compound in the region of the substrate to form CdTe as a layer on the substratre, the Te compound combines with the Hg vapour to form a HgTe



layer on the substrate, the thickness of both layers allowing diffusion during growth to give a layer of $Cd_xHg_{1-x}Te$ where $0<x<1$.

4,566,919

SENSITIZED CAST EMULSION EXPLOSIVE COMPOSITION

Harvey A. Jessop, Lehi, Utah, assignor to IRECO Incorporated, Salt Lake City, Utah

Filed Apr. 5, 1984, Ser. No. 597,415

Int. Cl.[3] C06B *45/08*

U.S. Cl. 149—20 **12 Claims**

1. A cast explosive composition, which comprises a water-in-oil emulsion when formulated at an elevated temperature but which becomes cast upon cooling due to a weakening or breakdown of the emulsion, further comprising inorganic oxidizer salt primarily consisting of ammonium nitrate; a water-immiscible organic liquid fuel; less than about 5% water by weight of the total composition; a sensitizer to provide a critical diameter no larger than about 150 mm at a temperature of about 5° C.; and an emulsifier which allows the formation of a water-in-oil emulsion at an elevated formulation temperature but which allows the emulsion to become unstable and the inorganic oxidizer salt to crystallize at ambient temperature to produce a cast composition.

4,566,920

COMPOSITIONS OF THE EXPLOSIVE EMULSION TYPE, PROCESS FOR THEIR MANUFACTURE AND APPLICATION OF THESE COMPOSITIONS

Jean-Claude Libouton, Nieuwe 27 rue Tremouroux, Orbais-Perwez, Belgium (B-5923); Lucien Waterlot, Hoevenstraat 10, Mol, Belgium (B-2400), and Georges Van Roy, rue Victor Hugo 223, Bruxelles, Belgium (B-1040)

Filed Mar. 2, 1984, Ser. No. 585,554

Claims priority, application European Pat. Off., Mar. 18, 1983, 83 870026

Int. Cl.[4] C06B *45/02*

U.S. Cl. 149—21 **25 Claims**

1. An explosive composition of the water-in-oil emulsion type, comprising at least one emulsified gel comprising an oxidising solution obtained from at least one inorganic salt dissolved in water and of a fuel phase containing at least one liquid hydrocarbon and an emulsifier, in combination with an inert or reactive lightening constituent characterised in that it contains texturizing means for facilitating cartridging, the texturizing means including from 4 to 55% of inert or semi-inert solids comprising a silicate associated with diatomaceous earths in proportion of 1 to 4 parts of silicate and 0 to 7 parts of diatomaceous earths, the inert or semi-inert solids being in a form other than microspheres and being free of entrapped gas, the composition having a non-sticky plastic to semi-plastic texture suitable for introduction to a paper cartridge on a conventional cartridging machine.

4,566,921

PRIMING COMPOSITION WHICH IS SENSITIVE TO PERCUSSION AND A METHOD FOR PREPARING IT

Jean Duguet, Tarbes, France, assignor to L'Etat Francais represente par le Delegue Ministeriel pour L'Armement, France

Filed Feb. 8, 1985, Ser. No. 699,472

Int. Cl.[4] C06B *43/00*

U.S. Cl. 149—22 **10 Claims**

1. A percussion-sensitive priming composition with an elevated thermal stability comprising:

a primary explosive having a tetrazolic ring, and

a sensitivity additive, said sensitivity additive comprising an oxidizing agent and a reducing agent;

wherein said primary explosive comprises 40 to 95 weight percent of said priming composition, said oxidizing agent comprises 2.5 to 40 weight percent of said priming composition and said reducing agent comprises 2.5 to 40 weight percent of said priming composition.

4,566,922

METHOD AND APPARATUS FOR REMOVING DEFECTIVE CORRUGATED BOARD BY SPLICING

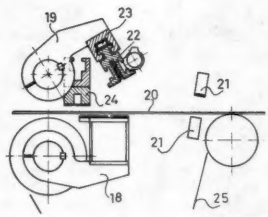
Manuel T. Martinez, Sancho et Fuerte, 21, Pamplona, Spain

Continuation-in-part of Ser. No. 436,788, Oct. 26, 1982, abandoned. This application Dec. 28, 1984, Ser. No. 687,386

Claims priority, application Spain, Oct. 28, 1981, 506652

Int. Cl.[4] B31F *1/24, 5/06;* B65H *19/08*

U.S. Cl. 155—64 **8 Claims**



1. A process for deleting defective sections in a web of a corrugated cardboard, said process comprising the steps of:

(a) accumulating a store of said web on a bridge of a corrugated cardboard production line, at least some portion of said production line being downstream with respect to said bridge;

(b) detecting a defective section in said web at a location upstream in said production line with respect to said bridge;

(c) closing two pairs of opposing jaws longitudinally displaced along said web at an input end of said bridge where said cardboard is accumulated in step (a), an upstream one of said pairs of jaws having a splicer with web holding and cutting capabilities associated therewith and a downstream set of said jaws having web holding brake means associated therewith;

(d) transversely cutting said web by said splicer at the start of a defective section and while said brake means hold the downstream cut end of said web;

(e) diverting the defective section of said web into a scrap storage area;

(f) transversely cutting the web by said splicer at the end of the defective section of said web;

(g) abutting and splicing together the upstream cut end of said web being held on said splicer jaws and the downstream cut end of said web being held in said brake means; and

(h) drawing said web from the storage accumulated in step (a) to maintain the operation of said portion of said downstream production line during steps (c) through (g) of said process.

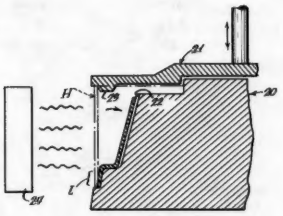
3. The process of claim 1 wherein said splicer has an associated member with a profile containing pulling means extending transversely across said web, and a roll of tape, said process step (g) including the step of causing said pulling means to move transversely across said web, while pulling said tape across said web, and sealing said tape across the cut and abutting ends of said upstream and downstream web.

4,566,923

METHOD AND APPARATUS FOR PREFORMING AND APPLYING A HEAT-SHRINKABLE MEMBER TO A CONTAINER

Martin Mueller, Wonder Lake, Ill., assignor to Osgood Industries, Inc., Northbrook, Ill.

Filed May 27, 1983, Ser. No. 498,973
Int. Cl.[4] B65B 7/00
U.S. Cl. 156—69 **13 Claims**



1. A method of applying a generally cylindrical, heat-shrinkable member to a container, wherein said container includes a lower portion having a downwardly inwardly tapered configuration and a lid portion fitted to said lower container portion, said method comprising the steps of:

providing preforming mandrel means at least partially configured like said container, wherein said mandrel means includes an inwardly tapered portion configured like said lower container portion;

providing said heat-shrinkable member in the form of a spirally-wound cylinder which is predominantly heat-shrinkable in a radial direction, wherein said cylinder comprises a strip of heat shrinkable material wound spirally at an angle to the axis of said cylinder;

positioning said heat-shrinkable member in association with said preforming mandrel means;

heating said heat-shrinkable member so that it conforms to said preforming mandrel means to form a preformed member from said heat-shrinkable member, and releasably retaining an edge portion of said heat-shrinkable member positioned furthest from said preforming mandrel means during said heating, said preformed member being at least partially configured like said container and, including an inwardly tapered portion;

moving said preformed member from association with said preforming mandrel means and positioning said preformed member in association with said container so that said tapered portion of said preformed member fits about the inwardly tapered lower portion of said container; and

applying said preformed member to said container by heating said preformed member so that is shrinks and further conforms to the configuration of said container to overlie said lid portion.

9. An apparatus for applying a heat-shrinkable member to a container wherein said container includes a lower portion having a downwardly inwardly tapered configuration and a lid portion fitted to said lower container portion, comprising:

means for preforming said heat-shrinkable member to form a preformed member having a pre-selected configuration comprising preforming mandrel means positionable in association with said heat-shrinkable member, said preforming mandrel means being at least partially configured like said container and including an inwardly tapered portion configured like said lower container portion, and means for heating said heat-shrinkable member while in association with said mandrel means;

means for releasably retaining an edge portion of said heat-shrinkable member positioned furthest from said mandrel means during heating thereof when the heat-shrinkable member is positioned in association with said preforming mandrel means to avoid premature shrinkage of said releasably retained portiqn of said heat-shrinkable member, to thereby form said preformed member with an inwardly tapered portion;

means for positioning said preformed member in association with said container so that said inwardly tapered portion of said preformed member fits about said inwardly tapered lower container portion; and

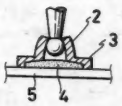
means for applying said preformed member to said container comprising means for heating at least a portion of said member to further conform said member to the configuration of said container so that said member overlies said container lid portion.

4,566,924

METHOD FOR FIXING STUD ON WORKPIECE

Kunio Hara, Kawasaki; Toshie Tanaka, Tokyo; Teruji Shibayama, Ohisomachi; Minoru Morisaki, Yokosuka, and Yoshio Kaneko, Chigasaki, all of Japan, assignors to Nifco, Inc., Yokohama, Japan

Filed Sep. 19, 1984, Ser. No. 652,070
Claims priority, application Japan, Sep. 21, 1983, 58-173231
Int. Cl.[4] B29C 65/06
U.S. Cl. 156—73.5 **20 Claims**



1. A method for fixing a first member upon a second member, comprising the steps of:

depositing hot-melt adhesive upon one surface of said first member to be bonded to one surface of said second member;

mounting said first member within a rotary tool for imparting relatively high-speed rotation to said first member;

moving said one surface of said first member, and said hot-melt adhesive deposited thereon, toward said one surface of said second member so as to contact said one surface of said second member with said hot-melt adhesive;

activating said rotary tool so as to rotate said first member and said hot-melt adhesive relative to said second member whereby only said hot-melt adhesive will be activated by means of the heat of friction generated between said hot-melt adhesive and said second member; and

stopping the rotation of said rotary tool and said first member after said activation of said hot-melt adhesive has attained a predetermined degree whereby said first member is able to be securely bonded to said second member by means of said activated hot-melt adhesive.

4,566,925

METHOD OF MOUNTING A METAL BAND ABOUT A COVER PLATE

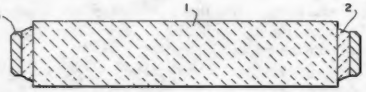
Jürgen Schnabel, and Jürgen Plath, both of Wiesbaden, Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 31, 1984, Ser. No. 575,937

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304938

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—86 2 Claims



1. A method of mounting a metal band about the peripheral surface of a ceramic sliding plate, for use with a sliding gate nozzle for controlling the discharge of molten metal from a vessel, and for ensuring a predetermined outer size of said metal band independent of variations in the size of the periphery of said ceramic sliding plate, and whereby said ceramic sliding plate can be mounted on a supporting frame by means of releasable clamps acting on said metal band, said method comprising:

covering said peripheral surface of said ceramic sliding plate with a layer of thermally setting mortar;

providing a steel ring of said predetermined outer size as said metal band, and heating and thereby expanding said steel ring;

positioning said heated steel ring around said mortar layer covering said peripheral surface of said ceramic sliding plate; and

cooling said steel ring, whereby said steel ring shrinks about said mortar layer to said predetermined outer size, while heating and thereby setting said mortar layer, such that said cooled steel ring is bonded about said peripheral surface by said mortar layer.

4,566,926

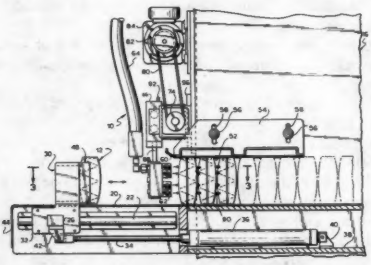
METHOD AND APPARATUS FOR MANUFACTURING INNERSPRING CONSTRUCTIONS

Walter Stumpf, Dunwoody, Ga., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 586,867, Mar. 9, 1984. This application Jan. 28, 1985, Ser. No. 695,311

Int. Cl.[4] B23K *19/04*

U.S. Cl. 156—165 25 Claims



1. An apparatus for manufacturing innerspring constructions from rows of pocketed coil springs, comprising:

support means for supporting a plurality of rows of pocketed coil springs;

applicator means for applying a bonding material to a row of pocketed coil springs;

moving means for moving said applicator means longitudinally along a row of pocketed coil springs supported by said support means; and

pressure means for applying pressure between two adjacent rows of pocketed coil springs after said applicator means has applied a bonding material between them.

4,566,927

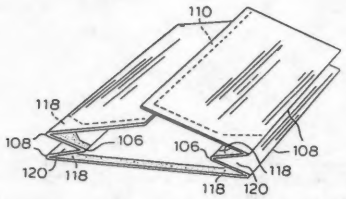
PATTERN BONDING OF WEBS BY ELECTRON BEAM CURING

James R. Wood, 103 Bedford Park Ave., Toronto, Ontario, Canada (M5M 1H9)

Continuation of Ser. No. 949,670, Oct. 10, 1978, abandoned. This application Dec. 2, 1980, Ser. No. 212,219

Int. Cl.[4] B29D *23/10*; B32B *31/20*

U.S. Cl. 156—203 8 Claims



1. A method of manufacturing a square bottom bag having a pair of longitudinal side gussets each formed by a central gusset fold line located centrally between a pair of outer gusset fold lines, a bottom wall forming portion extending transversely of said web and a longitudinal lap joint, from a continious web of bag forming material having oppositely disposed side edges comprising the steps of:

(a) continuously driving a web through a printing device in a flat unfolded configuration, the printing device being operable to apply an E.B. curable coating in a predetermined pattern to selected portions of an inner face of said web, said selected portions comprising,

(i) a marginal edge portion extending along a first of said free edges of said web,

(ii) a plurality of longitudinally spaced transversely extending portions, said transversely extending portions being located on the bottom wall forming portions of successive bag forming lengths of said web,

(iii) a triangular shaped portion associated with each outer gusset fold line, each triagular shaped portion having an apex located on and its opposite side bridging its associated outer gusset fold line at said each of said transversely extending portions,

(b) folding the web upon itself along said gusset fold lines to form a sleeve with each central gusset fold line disposed inwardly from its associated outer gusset fold lines and the marginal edge portion overlying a second marginal edge portion of the web whereby the coated areas are located at an interface between two layers of said web,

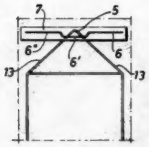
(c) continuously driving the folded web through an E.B. radiation device to radiate the web and thereby bond the coated areas at their interface to close the bottom of the bag and secure the marginal edges,

(d) transversely severing the web to form a plurality of independent bags each of which, upon opening, will form a square bottom.

4,566,928
METHOD OF MANUFACTURING PACKING CONTAINER HAVING TEAR-UP OPENING ARRANGEMENT

Hans A. Rausing, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 225,602, Jan. 16, 1981, Pat. No. 4,410,128. This application Jul. 29, 1983, Ser. No. 518,489
Claims priority, application Sweden, Jan. 21, 1980, 8000471
Int. Cl.⁴ B29D *23/10*
U.S. Cl. 156—217 **6 Claims**



1. A method of manufacturing a plurality of packing containers, comprising:

piercing a web of packing material with a plurality of cut portions to form a cut line, first and second cut portions being arranged along a common, straight line with an interruption therebetween, a third cut portion extending along said interruption and parallel to and spaced from said first and second cut portions, and additional cut portions for joining ends of said third cut portion to a respective end of said first and second cut portions;

covering said cut line with strip means;

joining edge regions of said web of packing material to form a tube;

pressing flat and sealing discrete regions transversely to an axis of said tube to form individual packing containers, wherein said cut line is so situated on said web of packing material that a boundary line of one of said discrete regions generally coincides with a center of said interruption so that when said indidvidual packing containers are formed the first cut portion of said cut line is in facing parallel relationship to the second cut portion of said cut line; and

forming a triangular lug on each of said individual packing containers, said first and second cut portions of said cut line extending on either side of an apex of said triangular lug with said common, straight line of said first and second cut portions passing through said apex and said third cut portion of said cut line being spaced from said apex.

4,566,929
PROCESS FOR MAKING A TRIM STRIP FOR AUTOMOBILE BODIES

Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Division of Ser. No. 468,721, Feb. 28, 1983, Pat. No. 4,446,179, which is a continuation-in-part of Ser. No. 380,783, May 21, 1982, abandoned. This application Apr. 2, 1984, Ser. No. 595,877
Int. Cl.⁴ B29C *65/48*; B29B *11/04, 11/06*
U.S. Cl. 156—242 **8 Claims**

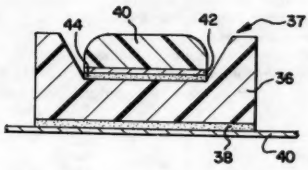
1. A process for forming a flexible trim strip suitable for application to an automobile body, comprising:

(a) forming a flexible elongate foil member having an upper surface and a lower surface and having sharply defined peripheral edges but no upstanding sidewalls,

(b) casting a fluent plastic composition onto said elongate foil member while said foil member is retained in a substantially flat condition free from surrounding side walls, such that said plastic flows to the sharply defined peripheral edges of said foil member and forms a positive meniscus,

(c) curing said plastic composition to form a flexible, weather-resistant clear plastic cap.

(d) forming an elongage flexible moulding having an elongate channel in one surface thereof,



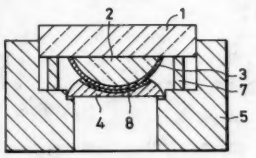
(e) placing said foil member having said plastic cap thereon into said channel, and

(f) securing said foil member in said channel via the lower surface thereof.

4,566,930
PROCESS FOR PRODUCING OPTICAL MEMBERS

Haruo Uehara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,727
Claims priority, application Japan, Sep. 30, 1983, 58-184137; Sep. 30, 1983, 58-184138; Sep. 30, 1983, 58-184139
Int. Cl.⁴ B32B *31/06, 31/12*
U.S. Cl. 156—280 **28 Claims**



12. A process for producing an optical member comprising forming a resin layer on the surface of a glass substrate by filling with a resin the gap between a master having a releasing layer on the surface and a glass substrate and separating the master to produce an optical member constituted of a glass substrate and a resin layer, characterized in that the releasing layer comprises a compound having a fluorine-substituted hydrocarbon group, and an alkoxysilane group or a silane halide group and the releasing layer is treated with an amine to make a strong adhesion between the compound forming the releasing layer and the surface of the master by chemical bonding.

4,566,931
HEAT SEALING TEXTILES WITH COPOLYAMIDES

Hans J. Panoch, Haltern; Rainer Feldmann; Hans Hinn, both of Marl; Siegfried Brandt, Haltern, and Hans-Jürgen Haage, Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,563
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248776
Int. Cl.⁴ C09J *3/14*
U.S. Cl. 156—330.9 **23 Claims**

1. In the method for heat sealing textiles comprising applying a heat sealable adhesive to one side of a textile substrate; and securing said textile substrate to a textile upper fabric with heat and pressure applied to said heat sealable adhesive, the improvement comprising said heat sealable adhesive having a specific viscosity of about 1.3 to 1.6 and

flow points of about 85° C. to 140° C. and consisting essentially of copolyamides produced from:

(A) 20 to 80% by weight of compounds selected from the group consisting of aliphatic omega amino carboxylic acids having 6 to 12 carbon atoms, lactams having 6 to 12 carbon atoms, and mixtures thereof; and

(B) 80 to 20% by weight of equimolar amounts of:

(a) aliphatic dicarboxylic acids having 6 to 12 carbon atoms; with

(b) aliphatic alpha-omega diamines having 6 to 12 carbon atoms wherein at least 30% by weight of said diamines consist of singly branched aliphatic diamines having 6 carbon atoms.

4,566,932

FLEXIBLE DUCT FORMING APPARATUS

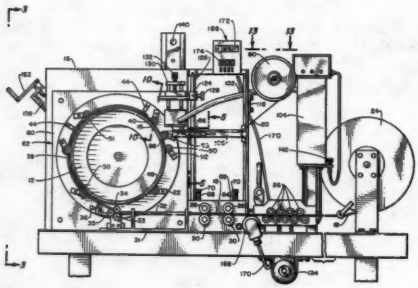
Hugh K. McGuire, 5220 Satsuma, North Hollywood, Calif. 91601

Continuation of Ser. No. 423,669, Sep. 27, 1982, which is a continuation-in-part of Ser. No. 161,425, Jun. 20, 1980, Pat. No. 4,351,682. This application Jun. 18, 1984, Ser. No. 621,560

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—429 **27 Claims**



1. A flexible duct forming apparatus comprising:

a base;

a mandrel;

support means on said base for rotatably supporting said mandrel;

drive means for rotatably driving said mandrel; said drive means comprising;

a pinion gear mounted on said base,

a gear mounted on the rear of said mandrel,

motor means for driving said pinion gear,

said mandrel support means adapted to move said mandrel to bring said mandrel gear in engagement with said pinion gear;

flexible strip material feed means for feeding flexible strip material to said mandrel;

wrapping means for wrapping said flexible strip onto said mandrel in a helical path with adjacent wraps having overlapping edges;

wire feed means comprising;

wire deforming means for deforming said wire to produce a predetermined coil diameter,

wire guide means forming a substantially fixed helical path of constant pitch and diameter for guiding and holding said wire on said substantially fixed helical path from said wire deforming means to between the overlapping edges of said flexible strip material,

sealing means for sealing the overlapping edges of said flexible strip material to encapsulate said wire whereby flexible wire reinforced duct is continuously formed on said mandrel.

4,566,933

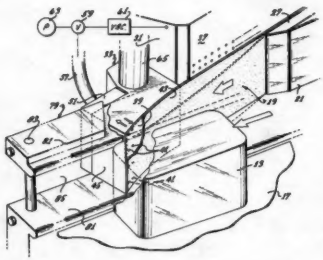
LABEL APPLICATOR FOR MULTIPLE PANEL WRAPPING

Michael Crankshaw, Santa Fe Springs, and George A. Allen, Irvine, both of Calif., assignors to Label-Aire Inc., Fullerton, Calif.

Filed May 23, 1984, Ser. No. 613,865

Int. Cl.⁴ B65C *9/28*; B32B *31/00*; B65H *26/00*; B44C *1/00*

U.S. Cl. 156—444 **14 Claims**



1. A label applicator for labeling articles moving along a path, said label applicator comprising:

means for releasably retaining a label at a label retaining station with the label being pullable along the retaining means;

label dispensing means for dispensing labels onto the label retaining means;

a wheel having a peripheral surface, at least a portion of said peripheral surface being resiliently deformable;

means for mounting said wheel for rotation with said wheel lying at least partially in the path of the articles at the label retaining station;

guide means adjacent said peripheral surface of said wheel for urging an article against the peripheral surface to resiliently deform the peripheral surface sufficiently to hold the article in a desired orientation at the label retaining station;

means for blowing a leading portion of the label on the label retaining means onto the article held in said orientation at the label retaining station while allowing the label retaining means to retain a trailing portion of the label whereby movement of the article past the label retaining station pulls the trailing portion of the label from the label retaining means; and

means downstream of said label retaining station for applying the trailing portion of the label to the article.

4,566,934

CLEANING TECHNIQUE FOR LPE MELT INGOTS

Daniel Brasen, Lake Hiawatha; Michael A. DiGiuseppe, Succasunna; Jose A. Lourenco, Elizabeth, and Subhash Mahajan, Summit, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1982, Ser. No. 437,472

Int. Cl.⁴ C30B *19/00*

U.S. Cl. 156—622 **12 Claims**

1. A method of manufacturing a device, which includes growing an epitaxial layer from the liquid phase, comprising the steps of:

(a) providing a solvent which is a solid at room temperature,

(b) heating the solid solvent above its melting point in an ambient of flowing gas for an extended period of time so that contaminants tend to coalesce on its surface,

(c) cooling the solvent to resolidify it,

(d) etching the solid solvent to remove the contaminants,

(e) adding solutes to the solvent,

(f) heating the solute and solvents to form a mixture,

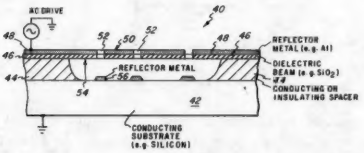
(g) bringing the mixture into contact with a heated substrate to effect growth of the epitaxial layer thereon.

4,566,935

SPATIAL LIGHT MODULATOR AND METHOD

Larry J. Hornbeck, Van Alstyne, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1984, Ser. No. 635,967
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*
U.S. Cl. 156—626 **6 Claims**



1. A method of fabrication of spatial light modulators, comprising the steps of:

(a) form electrical addressing circuitry on a substrate;

(b) deposit a spacer layer on said substrate and over said circuitry;

(c) deposit a reflecting layer on said spacer layer;

(d) pattern said reflecting layer to define a plurality of pixel elements connected to the remainder of said reflecting layer; and

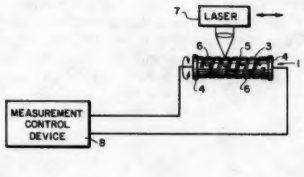
(e) plasma etch said spacer layer to form wells under said pixel elements, thereby freeing said pixel elements from said spacer layer and permitting them to be electrostatically deflected by signals on said addressing circuitry.

4,566,936

METHOD OF TRIMMING PRECISION RESISTORS

Stanley L. Bowlin, Weatherford, Tex., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,443
Int. Cl.[4] B23K *9/00;* **H01C** *10/00;* **B44C** *1/22;* **C23F** *1/02*
U.S. Cl. 156—627 **7 Claims**



1. A method for trimming precision resistors, wherein a resistive film is deposited onto a substrate compatible with said film, said method comprising the steps:

forming a helical groove in a surface of said resistor to increase the electrical resistance therethrough so that said electrical resistance is within a first tolerance below a desired electrical resistance;

forming small discrete depressions in the surface of said resistor to further increase the electrical resistance therethrough;

measuring the electrical resistance of said resistor during the forming of said small discrete depressions; and

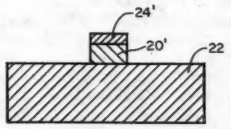
terminating the forming of said small discrete depressions when the electrical resistance through said resistor is within a second tolerance of said desired electrical resistance.

4,566,937

ELECTRON BEAM ENHANCED SURFACE MODIFICATION FOR MAKING HIGHLY RESOLVED STRUCTURES

John R. Pitts, Golden, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 10, 1984, Ser. No. 659,490
Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00;* **H01L** *21/306*
U.S. Cl. 156—628 **25 Claims**



12. A method of forming submicron structures by electron beam enhanced surface modification of a substrate, including the steps of:

(a) locating a substrate surface within an atmosphere of a partial pressure of a selected gas phase material that is capable of forming as dissociation products a reactant fragment and a stable leaving group when subjected to an electron beam;

(b) writing a beam exposure pattern directly on said substrate surface by applying to the surface an electron beam of submicron width through the gas phase to cause dissociation of the gas phase and accumulation of the reactant fragment at the interface of the beam and the substrate surface;

(c) continuing application of the electron beam to said pattern for a time sufficient and in dose sufficient to form a bound surface compound structure of the reactant fragment and substrate material locally coating the substrate surface in the beam exposure pattern; and

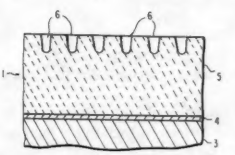
(d) etching the substrate surface by a selective means for removing uncoated substrate material preferentially to the removal of said surface compound structure.

4,566,938

TRANSFER ROLL WITH CERAMIC-FLUOROCARBON COATING CONTAINING CYLINDRICAL INK HOLES WITH ROUND, BEVELED ENTRANCES

Jerome D. Jenkins, 4749 N. 118th St., Wauwatosa, Wis. 53225, and Neal G. Schultz, 8584 W. Appleton Ave., Milwaukee, Wis. 53218

Division of Ser. No. 192,080, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 35,514, May 3, 1979, abandoned. This application Feb. 17, 1984, Ser. No. 581,121
Int. Cl.[4] B23K *9/00;* **B41F** *1/46;* **B44C** *1/22*
U.S. Cl. 156—643 **5 Claims**



1. A method of making a transfer roll comprising the steps of:

(a) providing a metal base;

(b) depositing a coating of ceramic-fluorocarbon material over said metal base; and

(c) forming ink holes in said ceramic-fluorocarbon coating said ink holes being generally cylindrical in shape, having a hemispherical bottom, a generally cylindrical intermediate portion and a rounded, beveled entryway.

4,566,939

SURFACE PREPARATION OF NICKEL BASE ALLOYS FOR BRAZING

Jule A. Miller, Derby; Jack W. Lee, Brookfield, both of Conn., and Jeffrey Thyssen, Montvale, N.J., assignors to Avco Corporation, Stratford, Conn.

Filed Jan. 25, 1985, Ser. No. 694,863

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*; C23F *1/00*

U.S. Cl. 156—655 **5 Claims**

1. A method for preparing for brazing the surface of nickel-base or nickel-iron base alloys containing at least one oxidizable metal selected from the group consisting of aluminum and titanium, the method comprising heating the alloy, prior to brazing, in air at an elevated temperature for a time sufficient to form on the alloy surface a bilayered film comprised of a first oxide top layer containing at least titanium or aluminum and a second layer beneath the first comprised of the alloy composition substantially depleted of the oxidizable metal and then cleaning the surface of the alloy to remove the first oxide layer.

4,566,940

MANUFACTURING PROCESS FOR SEMICONDUCTOR INTEGRATED CIRCUITS

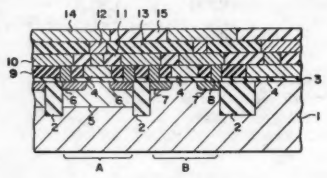
Manabu Itsumi, Hoya; Kohei Ehara, Kodaira; Susumu Muramoto, and Seitaro Matsuo, both of Hachioji, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Division of Ser. No. 369,234, Apr. 16, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 661,700

Claims priority, application Japan, Apr. 21, 1981, 56-61070

Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*

U.S. Cl. 156—643 **3 Claims**



1. A method for the manufacture of a semiconductor integrated circuit, comprising the step of:

forming a resist pattern on a first material layer of a semiconductor substrate;

removing a portion of said first material layer through using said resist pattern as a mask to form a recess in said first material layer;

forming a second material layer by a plasma deposition process to thickness substantially equal to the depth of said recess so as to fill said recess; and

removing said second material layer on said resist pattern by a lift-off process, along with said resist pattern;

wherein said steps are each carried out repeatedly at least four times.

4,566,941

REACTIVE ION ETCHING METHOD

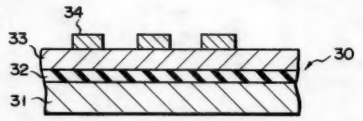
Yukimasa Yoshida, Kawasaki, and Tohru Watanabe, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 9, 1984, Ser. No. 608,449

Claims priority, application Japan, May 10, 1983, 58-81309; Sep. 14, 1983, 58-169889

Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*

U.S. Cl. 156—643 **6 Claims**



1. A reactive ion etching method which comprises the steps of (a) mounting an object of etching comprising a 3-ply structure having a conductive material formed on a semiconductor body with a thin insulation layer interposed therebetween on a pair of mutually facing electrodes provided in a vacuum vessel on which high frequency power is impressed; (b) impressing said high frequency power between said mutually facing electrodes in an atmosphere of a reactive gas to etch said object body; (c) reducing gradually the cathode drop voltage arising in the proximity of the electrode being impressed with high frequency power, immediately before stopping the impression of high frequency power at the end of ion etching and thereby reducing the voltage impressed on the insulation layer included in said object of etching and caused by the reverse flow of an electric charge stored in the lower electrode to such an extent that a voltage impressed on the insulation layer included in the object of etching drops to a lower level than the breakdown voltage of said insulation layer at the stoppage of the impression of said high frequency power; and (d) thereafter stopping the impression of said high frequency voltage.

4,566,942

METHOD OF AND APPARATUS FOR TREATING WASTE PAPER

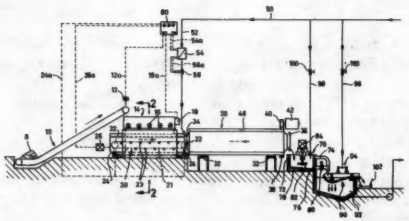
Emil Holz, Eningen, and Hagen Hutzler, Reutlingen, both of Fed. Rep. of Germany, assignors to Hermann Finckh Maschinenfabrik GmbH & Co., Pfullingen, Fed. Rep. of Germany

Division of Ser. No. 398,773, Jul. 16, 1982, Pat. No. 4,465,591, which is a continuation of Ser. No. 194,823, Oct. 7, 1980, abandoned. This application Jul. 12, 1984, Ser. No. 630,309

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941898

Int. Cl.⁴ D21D *5/04*

U.S. Cl. 162—4 **5 Claims**



1. A method of treating waste paper comprising dissolvable fibrous material and non-dissolvable material without comminution of the non-dissolvable material, the method comprising:

steeping the waste paper in water for between 10 and 120 minutes at a substance density of between 10% and 40%;

repeadedly lifting and dropping the waste paper as it is steeped;

adding sufficient diluting water to the steeped material to achieve a substance density of between 2% and 6%;

circulating and mixing the steeped material and the diluting water in order to obtain a fibrous suspension without comminution of the non-dissolvable material;

pressurelessly feeding said fibrous suspension and said non-dissolvable material to a screening station; and

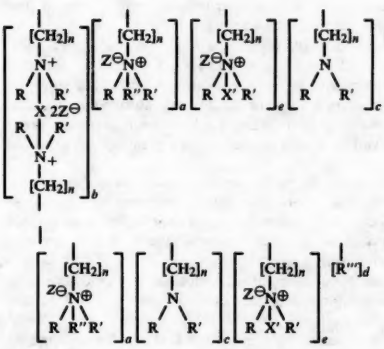
pressurelessly sorting the fibrous suspension from the non-dissolvable material.

4,566,943
WET STRENGTH MATERIAL

Per E. A. Hansson, and Felek Jachimowicz, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 476,584, Mar. 18, 1983, Pat. No. 4,513,121. This application Nov. 21, 1984, Ser. No. 673,837
Int. Cl.⁴ D21H *3/40*
U.S. Cl. 162—168.2 **6 Claims**

1. A process of improving the wet strength properties of paper sheet products by contacting the cellulose material forming said paper sheet products with from 0.01 to 3 weight percent based on the dry weight of the cellulosic material of a water soluble polymer having a substantially completely saturated polymeric backbone chain with a pendant alkylene amine groups represented by the formula:



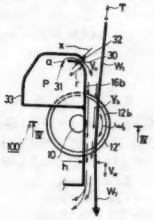
wherein

represents a substantially saturated hydrocarbon polymer chain, each R separately represents an unsubstituted or substituted C_1–C_6 alkyl, cycloalkyl or aryl; R′ represents hydrogen or an R group; R″ represents hydrogen or a C_1–C_3 alkyl; R‴ represents hydrogen or a comonomer pendant group or both, X is a residual organic group of a compound capable of covalently bonding with at least two nitrogen atoms of the polymer; X′ represents a residual organic group having at least one unreacted functional group capable of reacting with secondary or tertiary amine or secondary hydroxy group; Z is a counter-ion; n is an integer of from 1 to 3; a, b, c, d and e are each integers such that a, c and e is from about 1 to 90 percent, b is from about 1 to 30 percent and d is from about 1 to 60 percent of the total sum of a+b+c+d+e; and the sum of the groups of a+c+e is at least 4 weight percent of the polymer product; said polymer is formed by reacting under substantially anhydrous conditions an olefinic bond containing polymer with an amine selected from a primary or secondary amine, hydrogen and carbon monoxide in the presence of a Group VIII metal containing compound to form a polymeric material having pendant alkylene amine groups and further reacting a portion of the alkylene amine groups with an agent which is at least difunctional with respect to the pendant secondary and tertiary amino groups, said difunctional agent being in molar ratio of from 0.3 to 1.1 with respect to said secondary amine groups and from 0.5 to 2.2 with respect to said tertiary amino groups and causing the reactive group contained in X′ to further react with either the secondary and/or tertiary amino groups of said polymer or of the hydroxyl groups of the cellulosic material.

4,566,944
APPARATUS FOR CUTTING A LEAD-IN STRIP FROM A PAPER WEB IN A PAPER MACHINE

Pekka Mauranen, and Timo Vedenpää , both of Jyväskylä , Finland, assignors to Valmet Oy, Finland

Filed Apr. 26, 1983, Ser. No. 488,664
Claims priority, application Finland, Apr. 27, 1982, 821446
Int. Cl.⁴ D21F *1/36*
U.S. Cl. 162—286 **10 Claims**



1. Apparatus for forming a lead-in strip from a paper web in a multiple cylinder dryer section of a paper machine and for increasing the width of the lead-in strip by a so-called oblique draw, comprising:

a substantially transversely extending beam situated alongside a region of an unsupported draw of the web in the dryer section;

a carriage mounted on said beam for traversing movement thereon;

means mounted on said carriage for cutting the web to form the lead-in strip;

substantially planar guide surface means mounted on said carriage in association with said web cutting means, said guide surface means being substantially parallel to the run of the web over at least the unsupported web draw region, and

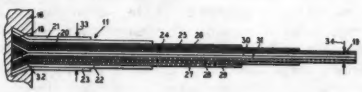
means for directing a gas flow onto said planar guide surface means into a space between said guide surface means and the web to stabilize the web run as it passes alongside said web cutting means;

wherein said planar guide surface means and said gas flow directing means are arranged such that the run of the web is spaced a substantially constant distance from said guide surface means.

4,566,945
HEADBOX TRAILING ELEMENT

James L. Ewald, Beloit, Wis., and José J. A. Rodal, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 11, 1984, Ser. No. 598,968
Int. Cl.⁴ D21F *1/06, 1/02*
U.S. Cl. 162—343 **17 Claims**



1. A paper machine element for use in a headbox for deliver-

ing stock to a forming surface, the headbox having a slice chamber and a slice opening, the element comprising:

a trailing element for positioning in a slice chamber for stock flow induced movement;

said element to extend transversely of the headbox and having a greater structural strength and stiffness in the machine directin than in the cross-machine direction at an upstream end and having a greater structural stiffness in the cross-machine direction than in the machine direction at a downstream end to minimize instability so that the element resists deflection in the cross-machine direction by transient pressure variations and offers low resistance to deformation in the fluid flow stream for balancing pressure forces on opposite sides of the element;

and means for anchoring said element in the slice chamber at the upstream end with the downstream end to be unattached and constructed to be self-positionable so as to be responsive to forces exerted therein by the stock flowing over the surfaces of the element.

4,566,946

TRANSFER ARRANGEMENT FOR GUIDING THE PAPER WEB FROM THE PRESS SECTION OF A PAPER MACHINE TO IT'S DRYING SECTION

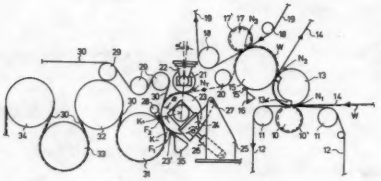
Martti Koponen, and Olli Tapio, both of Jyväskylä, Finland, assignors to Valmet Oy, Finland

Filed Oct. 31, 1983, Ser. No. 546,925

Claims priority, application Finland, Nov. 2, 1982, 823742

Int. Cl.[4] D21F *3/04*

U.S. Cl. 162—359 **17 Claims**



1. In a paper making machine including a press section followed in the machine direction by a drying section including a lower row of drying cylinders and an upper row of drying cylinders and a drying wire passing over said drying cylinders, said drying section not including a lead-in drying cylinder, transfer apparatus for guiding a paper web from the press section to the drying section, comprising:

a smoothing press including a smoothing nip formed between upper and lower smoothing press rolls to which the paper web is passed from the press section, said smoothing press being situated between the press and drying sections with said lower smoothing press roll being situated at a position which is normally occupied by a lead-in drying cylinder of a conventional drying section substantially in the upper row of drying cylinders;

first guide roll means for guiding said drying wire of the drying section over an elongated angular sector of said lower smoothing press roll, said elongated angular sector having a size sufficiently large that the web is transferred onto said drying wire, said drying wire carrying the web as a closed draw to said drying section onto a first one of said drying cylinders and between drying cylinders of said lower and upper rows of the drying section; and

said upper and lower smoothing press rolls are smooth-faced press rolls, said lower smoothing press roll having a substantially larger diameter than that of said upper smoothing press roll, and wherein no fabric passes through said smoothing nip so that the web is in direct contact with the faces of said smoothing press rolls.

4,566,947

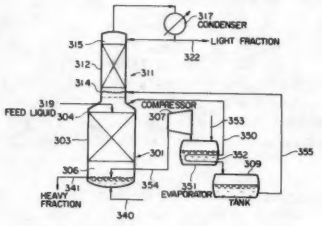
METHOD OF SEPARATING A MIXED LIQUID INTO LIGHT AND HEAVY FRACTIONS BY DISTILLATION

Hidemasa Tsuruta, 1-19-15, Minamitokiwadai, Itabashi-ku, Tokyo, Japan

Division of Ser. No. 424,561, Sep. 27, 1984, abandoned. This application Dec. 21, 1984, Ser. No. 684,712

Int. Cl.[4] B01D *3/14, 1/28*

U.S. Cl. 203—26 **4 Claims**



1. A method of separating a mixed liquid into a light fraction having a first boiling point and heavy fraction having a second boiling point which is higher, under a given pressure than said first boiling point by at least 15° C., said mixed liquid having a boiling point nearer said second boiling point than said first boiling point, said method comprising:

rectifying said mixed liquid in a first distillation zone operated at said given pressure in such a manner as to obtain said heavy fraction as its bottom product and an intermediate fraction as its top product, said intermediate fraction having a boiling point higher than said first boiling point but lower than said second boiling point by less than 20° C.,

introducing said intermediate fraction into an evaporator for vaporizing a vaporizable liquid by indirect heat exchange therewith, thereby obtaining a vapor of said vaporizable liquid with the simultaneous condensation of said intermediate fraction,

compressing the vapor of said vaporizable liquid to a temperature higher than that of said heavy fraction in said first zone,

heating said heavy fraction in said first distillation zone by heat exchange with said compressed vapor to effect said rectification in said first distilllation zone, and

distilling said condensed intermediate fraction in a second distillation zone operated so as to obtain said light fraction as its top product.

4,566,948

SEPARATION OF ISOPROPYL ETHER FROM ISOPROPANOL AND WATER BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd. Ave., and An-I Yeh, 700 S. 12th Ave., both of Bozeman, Mont. 59715

Filed Dec. 20, 1984, Ser. No. 684,367

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.[4] B01D *3/40*

U.S. Cl. 203—51 **2 Claims**

1. A method for recovering essentially anhydrous isopropyl ether from a mixture of isopropyl ether, isopropanol and water, which comprises distilling a mixture of isopropyl ether, isopropanol and water in a rectification column in the presence of an extractive agent, recovering essentially pure isopropyl ether as overhead and obtaining the extractive agent and isopropanol and water from the stillpot or reboiler, the extractive agent comprises at least dimethylsulfoxide.

4,566,949

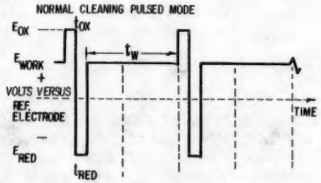
METHOD OF OPERATING A SELF CLEANING ELECTROCHEMICAL DETECTOR

Terry A. Berger, Landenberg, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 543,663, Oct. 19, 1983, Pat. No. 4,496,454. This application Oct. 11, 1984, Ser. No. 659,792

Int. Cl.[4] G01N *30/62*

U.S. Cl. 204—1 T 11 Claims



1. A method of detecting the concentration of electrochemical species in a fluid with an electrochemical cell with a working electrode comprising:

oxidizing the working electrode for a period less than or equal to 200 milliseconds;

reducing the working electrode for a period less than or equal to 200 milliseconds;

applying a working potential to the working electrode for a period less than or equal to 800 milliseconds; and

measuring a current produced by electrochemical reactions on the working electrode at the working potential for integer multiples of a main power line period.

4,566,950

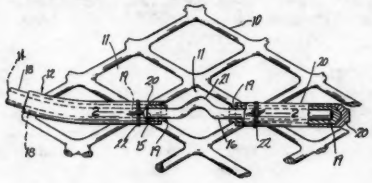
METHOD OF MONITORING AN ELECTROLYTIC CELL

Ronald C. Miles, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 631,427, Jul. 16, 1984, abandoned, which is a division of Ser. No. 373,204, Apr. 29, 1982, Pat. No. 4,500,402. This application May 6, 1985, Ser. No. 730,883

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T 44 Claims



1. A method of monitoring the operation of an electrolytic cell having at least one cathode and at least one anode, each cathode and anode being sandwiched about a separator and having anode and cathode surfaces, the method comprising:

(a) placing a first wire reference electrode with a first reference wire portion adjacent and between the cathode surface and separator, the reference wire l; portion extending at least partially into the plane of the cathode surface;

(b) connecting a first voltmeter to the first wire reference electrode and the cathode;

(c) placing a second wire reference electrode with a second reference wire portion adjacent and between the separator and the anode surface, the second reference wire portion extending into the plane of the anode surface;

(d) connecting a second voltmeter to the second wire reference electrode and the anode;

(e) connecting a third voltmeter to the anode and the cathode;

(f) recording a first potential reading of the cathode surface from the first voltmeter;

(g) recording a second potential reading of the anode surface from the second voltmeter; and

(h) recording a third potential reading from the third voltmeter;

(i) determining the potential of the separator and surrounding electrolyte from the difference between the third potential reading and the sum of the first potential reading and the second potential reading.

4,566,951

METHOD FOR CLEANING CATHODE OR ANODE PLATES

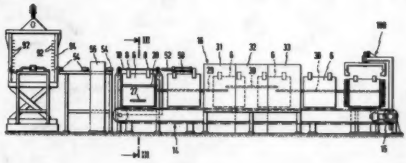
Gustav S. I. Norberg; Kjell E. L. Segerström, both of Karlstad, and Tommy E. Ahl, Kil, all of Sweden, assignors to Wenmec AB, Kil, Sweden

Filed Mar. 5, 1984, Ser. No. 586,276

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307890

Int. Cl.[4] C25D *1/04;* B08B *3/02*

U.S. Cl. 204—12 12 Claims



1. A method for cleaning cathode and/or anode plates obtained in an electrolytic refining of metals, the cathode plates being originally deposited on thin starting sheets consisting essentially of the same metal being refined and including loops for accommodating cathode bars to enable a suspension of the cathode plates in an electrolytic bath, the anode plates including suspension lugs, the method comprising the steps of:

lifting the cathode plates or anode plates from the electrolytic bath by the cathode bars or lugs in groups of plates;

transferring the cathode plates or anode plates from the electrolytic bath to a washing unit including supporting the cathode or anode plates at a lower edge thereof;

removing the cathode bars from the cathode plates prior to an entry of the cathode plates into the washing unit;

successively passing at least one of the cathode plates or at least one of the anode plates through the washing unit in a direction extending substantially parallel to flat sides of the plates; and

subjecting the cathode plate or anode plate to a washing operation in the washing unit by spraying the flat sides of the plates with wash liquid sprayed through nozzle means which execute a relative movement along the flat sides of the plates.

4,566,952

TWO-STAGE PROCESS FOR THE PRODUCTION OF ANODICALLY OXIDIZED ALUMINUM PLANAR MATERIALS AND USE OF THESE MATERIALS IN MANUFACTURING OFFSET-PRINTING PLATES

Gerhard Sprintschnik, Taunusstein; Walter Niderstätter, Eltville, and Joachim Stroszynski, Wiesbaden-Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,538

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312497

Int. Cl.[4] C25D *11/08, 11/12, 11/16, 11/18*

U.S. Cl. 204—27 17 Claims

1. A process for producing an aluminum or aluminum alloy material in the form of a plate, foil or strip, comprising the step of anodically oxidizing a support material in a two-stage oxidation process comprising the steps of:

(a) first treating said support material in an aqueous electrolyte comprising from about 60 to 180 g/l of phosphoric acid, at a temperature of from about 47° to 70° C. and a voltage of from about 36 to 80 V, and

(b) subsequently treating said support material in an aqueous electrolyte comprising from about 60 to 300 g/l of sulfuric acid, at a temperature of from about 30° to 65° C. and a voltage of from about 15 to 35 V.

4,566,953

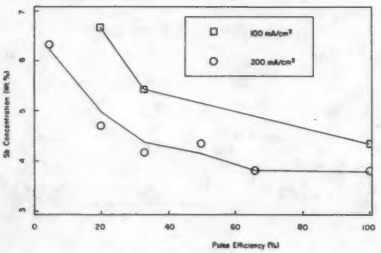
PULSE PLATING OF NICKEL-ANTIMONY FILMS

Tae Y. Kim, Carmel Township, Hamilton County, Ind., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 24, 1984, Ser. No. 685,774

Int. Cl.[4] C25D *3/56, 5/18*

U.S. Cl. 204—28 11 Claims



1. A method for electroplating a nickel-antimony alloy onto a metallic substrate comprising from 1 to 12 weight percent antimony comprises electroplating the alloy from a solution containing a soluble nickel salt and a soluble mixed antimony-alkali metal salt at a pH of from about 1 to 6 by means of a pulsed current having an on-time of from 5 to 20 milliseconds and an off-time of from 150 to 300 milliseconds.

3. The method recited in claim 1, wherein the substrate is a wire which is drawn through the plating solution.

4,566,954

METHOD OF AND APPARATUS FOR SPLIT ROLLING OF STEEL SHEET

Tadahiko Nogami, Chiyoda, and Tadashi Nishino, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

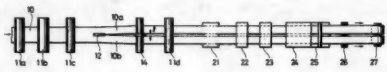
Filed Dec. 9, 1982, Ser. No. 448,074

Claims priority, application Japan, Dec. 9, 1981, 56-196862

Int. Cl.[4] C25D *7/06;* B21B *1/00*

U.S. Cl. 204—28 9 Claims

5. A method according to claim 1, wherein said rolling rolls by a tandem rolling mill having a plurality of rolling stands, and said step of slitting said wide steel sheet in the breadthwise direction is conducted between at least two of said rolling stands; said step of plating being conducted to plate said slit steel sheets, after they have been rolled by said step of rolling, with a plating material been including zinc; and said step of



moving further maintaining a distance between adjacent slit steel sheets during subsequent rolling at least greater than 20 mm.

4,566,955

PREPARATION OF FINELY DIVIDED ELECTRICALLY CONDUCTIVE PYRROLE POLYMERS

Herbert Naarmann, Wattenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,946

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325893

Int. Cl.[4] C25D *9/02;* H01B *1/12*

U.S. Cl. 204—59 R 2 Claims

1. A process for preparing a finely-divided electrically conductive pyrrole polymer comprising the following sequential steps:

(A) carrying out a solution polymerization of an unsubstituted or substituted pyrrole monomer taken either alone or in an admixture with one another in the presence of from about 0.2 to 10 moles of an oxygen-containing oxidizing agent per mole of pyrrole monomer to produce a finely-divided pyrrole polymer, and

(B) effecting an electrochemical charging of said pyrrole polymer in a non-aqueous electrolyte system in the presence of a conductive salt, with said electrochemical charging being conducted at a current density of from 0.01 to 10 mA/cm^2, a voltage of from 0.1 to 100 V, and over a time period of from about 0.1 to 30 hours.

4,566,956

ELECTROCHEMICAL CONVERSION OF SOLUBLE SALTS OF INSOLUBLE ACIDS TO THEIR ACID FORM

Robert A. Cipriano, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1984, Ser. No. 679,503

Int. Cl.[4] C25B *3/00;* B01D *57/02*

U.S. Cl. 204—72 1 Claim

1. A method for producing water insoluble organic acids from their water soluble salts, said salts produced under conditions wherein the ammonium salt thereof is not readily and efficiently produced during conventional production techniques or is incapable of being formed in a non-equilibrium cationic substitution reaction, which comprises

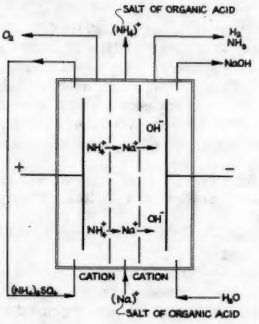
electrochemically converting the water soluble salt of the water insoluble organic acid to its ammonium salt by feeding:

the ammonium salt of a strong inorganic acid to an anolyte chamber of a three chamber electrochemical cell;

a water soluble salt of a water insoluble organic acid to the middle chamber of said electrochemical cell; and,

in the catholyte chamber of said cell, a hydroxide of the cation moiety of the organic acid salt; thereby electrochemically converting said organic acid salt to its ammonium salt, in the middle compartment, said strong inorganic acid to its free acid form in the anolyte chamber, and water to its hydroxyl and hydrogen components, in the catholyte chamber, the hydroxyl component reacting with the cation moiety of the water soluble salt of said organic acid fed to the middle compartment, and wherein, the ammonium salt of the organic acid and the inorganic

acid produced in the anolyte chamber are recovered from the cell and reacted with each other to form the free acid of the organic ammonium salt and the ammonium salt of the strong inorganic acid; and, returning the ammonium salt of the strong inorganic acid to the anolyte chamber.



ELECTROCHEMICAL CELL FOR MULTIPLE ION SUBSTITUTION

4,566,957

USE OF GAS DEPOLARIZED ANODES FOR THE ELECTROCHEMICAL PRODUCTION OF ADIPONITRILE

John C. Trocciola, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 10, 1984, Ser. No. 680,405

Int. Cl.[4] C25B *3/00*

U.S. Cl. 204—73 A **5 Claims**

1. A method of hydrodimerizing acrylonitrile to produce adiponitrile in an electrochemical system in cells that contain at least one aqueous electrolyte, reductant, an anode and a cathode comprising:

(a) maintaining the aqueous electrolyte in contact with the cathode and a gas depolarized anode;

(b) maintaining a supply of acrylonitrile at the cathode;

(c) maintaining a supply of reductant at the anode; and

(d) passing a direct electric current through said system causing hydrodimerization of the acrylonitrile to adiponitrile at the cathode and oxidation of the reductant at the anode;

requiring an anode voltage of less than about 400 millivolts at 100 milliamperes per square centimeter of electrode area.

4,566,958

PROCESS FOR ELECTROCHEMICAL ROUGHENING OF ALUMINUM USEFUL FOR PRINTING PLATE SUPPORTS, IN AN AQUEOUS MIXED ELECTROLYTE

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 4, 1985, Ser. No. 689,002

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400249

Int. Cl.[4] C25F *3/04*

U.S. Cl. 204—129.75 **2 Claims**

1. A process for the electrochemical roughening of a plate of aluminum or an alloy thereof which is useful for a printing plate support, comprising the steps of (A) immersing the plate in an aqueous mixed electrolyte solution containing (i) from about 0.5 to 10% by weight HCl and (ii) a further inorganic acid comprising HF, such that said mixed electrolyte solution contains from about 0.05 to 5% by weight of HF; and (B) applying an alternating current to the plate to produce a uniformly roughened offset printing plate support.

4,566,959

PROCESS FOR THE ELECTROCHEMICAL ROUGHENING OF ALUMINUM USEFUL FOR PRINTING PLATE SUPPORTS, IN AN AQUEOUS MIXED ELECTROLYTE

Dieter Mohr, Schlangenbad, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 4, 1985, Ser. No. 689,001

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400248

Int. Cl.[4] C25F *3/04*

U.S. Cl. 204—129.75 **4 Claims**

1. A process for the electrochemical roughening of a plate of aluminum or an alloy thereof which is useful for a printing plate support, comprising the steps of (A) immersing the plate in an aqueous mixed electrolyte solution containing (i) from about 0.5 to 10% by weight of HCl and (ii) at least one further inorganic electrolyte comprising an inorganic fluorine compound which is present in the form of an acid or an alkali metal salt and which contains an anion comprised of fluorine and at least one further element, such that said mixed electrolyte solution contains from about 0.05 to 5% by weight of said fluorine compound; and (B) applying an alternating current to the plate to produce a uniformly roughened plate for use as an offset printing plate support.

4,566,960

PROCESS FOR ELECTROCHEMICAL ROUGHENING OF ALUMINUM USEFUL FOR PRINTING PLATE SUPPORTS, IN AN AQUEOUS MIXED ELECTROLYTE

Dieter Mohr, Schlangenbad, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 4, 1985, Ser. No. 689,003

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400250

Int. Cl.[4] C25F *3/04*

U.S. Cl. 204—129.75 **6 Claims**

1. A process for the electrochemical roughening of a plate of aluminum or an alloy thereof which is useful for a printing plate support, comprising the steps of (A) immersing the plate in an aqueous mixed electrolyte solution containing (i) from about 0.3 to 4% by weight of HNO_3 and (ii) at least one further inorganic electrolyte comprising an inorganic fluorine compound which is present in the form of an acid or an alkali metal salt and which contains an anion comprised of fluorine and at least one further element, such that said mixed electrolyte solution contains from about 0.05 to 5% by weight of said fluorine compound; and (B) applying an alternating current to the plate to produce a uniformly roughened offset printing plate support.

4,566,961

ELECTRIC ARC CONVERSION PROCESS

Henri Diaz, Dunkerque; Pierre Jorgensen, La Haye Les Roses, and Pierre Vernet, Martigues, all of France, assignors to The British Petroleum Company p.l.c., London, England

PCT No. PCT/GB84/00067, § 371 Date Oct. 18, 1984, § 102(e) Date Oct. 18, 1984, PCT Pub. No. WO84/03515, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 1, 1984, Ser. No. 668,280

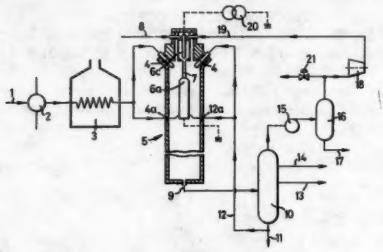
Claims priority, application France, Mar. 2, 1983, 83 03424

Int. Cl.[4] C25C *3/24*

U.S. Cl. 204—168 **11 Claims**

1. A process for the electric arc conversion of high molecular weight carbonaceous material contained in a feed stream to low molecular weight products characterized in that a hydrocarbon feed stream containing a substantial proportion of

C_1–C_4 saturated hydrocarbon and a feed stream containing high molecular weight carbonaceous materials are brought into contact with an electric arc, said feed stream containing



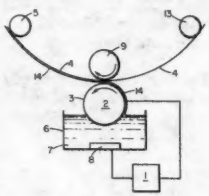
said high molecular weight carbonaceous material being brought into contact, in the vicinity of the arc, with a hot gas stream derived from the said hydrocarbon feed stream containing C_1–C_4 saturated hydrocarbon.

4,566,962

ELECTRODEPOSITED CONTINUOUS THIN FILM TRANSFER PROCESS FOR PRODUCING FILM FUNCTIONAL AS BARRIER COATINGS

Vincent McGinniss, Delaware, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 23, 1983, Ser. No. 565,071
Int. Cl.⁴ C25D *13/06, 13/10*
U.S. Cl. 204—180.9 **12 Claims**



1. A process for electrodepositing a thin continuous film coating of less than 1 mil thickness onto a first substrate and then transferring said deposited thin continuous film coating onto a second substrate which comprises:

(a) dispersing an anodic or cathodic electrodepositable polymer having at least 100% elongation, a surface energy of less than 50 dynes/cm., and, if anodic an acid number less than 100 or if cathodic an amine equivalency value less than 60;

(b) dispersing a release effective amount of an anodic or cathodic elastomeric additive into intimate blend with said electrodepositable polymer, said additive having an elongation of at least 100%, a glass transition temperature greater than 0° C., and, if anodic an acid number less than 100 or if cathodic an amine equivalency value less than 60, so as to form an electrodepositable polymer-additive blend;

(c) electrodepositing said electrodepositable polymer-additive blend onto a first substrate forming a coated first substrate;

(d) contacting said coated first substrate to a second substrate so as to obtain greater adhesion between said electrodeposited polymer-additive blend and said second substrate than the adhesion between said first substrate and said electrodeposited polymer-additive blend;

(e) separating said electrodepositable polymer-additive blend from said first substrate by separating said coated first substrate from said second substrate so as to effect transfer of said electrodeposited polymer additive blend from said first substrate to said second substrate.

4,566,963

WATER-DISPERSIBLE BINDERS BASED ON MODIFIED EPOXIDE/AMINE ADDUCTS, AND THEIR PREPARATION AND USE

Günther Ott, Münster-Wolbeck; Arnold Dobbelstein; Michael Geist, both of Münster; Georg Schön, Everswinkel, and Klaas Ahlers, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben + Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,311
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409189
Int. Cl.⁴ C08G *59/14;* C25D *13/00*
U.S. Cl. 204—181.7 **29 Claims**

1. A water-dispersible binder based on modified epoxide/amine adducts, which comprises the reaction product of:

A. a polyepoxide having an epoxide equivalent greater than 1 and a mean molecular weight $\overline{M}_n$ of 140 to 5,000 with

B. a diphenylolalkanoate ester and

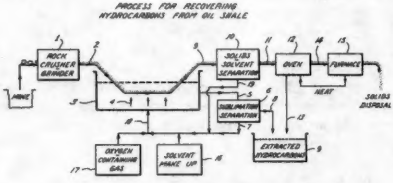
C. an amine.

4,566,964

METHOD OF RECOVERING HYDROCARBON FROM OIL SHALE

Robert H. Friedman, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 2, 1985, Ser. No. 751,343
Int. Cl.⁴ C10G *1/04*
U.S. Cl. 208—8 LE **23 Claims**



1. A method for recovering hydrocarbons from oil shale comprising mineral rock and kerogen materials comprising

(a) grinding the oil shale to a predetermined fineness;

(b) exposing the oil shale material to an oxidative environment comprising a free oxygen containing gas at a predetermined temperature for sufficient time to cause oxidative scission of a portion of the kerogen which produces organic fragments removed from the kerogen, said oxidative environment also including a liquid solvent for the organic fragments;

(c) separating the solvent and organic fragments from the residual solids; and

(d) separating the organic fragments from the solvent.

4,566,965

REMOVAL OF NITROGEN AND SULFUR FROM OIL-SHALE

William N. Olmstead, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 453,729, Dec. 27, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,892
Int. Cl.⁴ C10G *1/00, 1/02*
U.S. Cl. 208—11 R **7 Claims**

1. A process for enhancing the removal of nitrogen and sulfur from oil-shale, which process comprises:

(a) contacting the oil-shale with a sufficient amount of an

aqueous base solution comprised of at least a stoichiometric amount of one or more alkali metal or alkaline-earth metal hydroxides based on the total amount of nitrogen and sulfur present in the oil-shale, and in an amount sufficient to form a two phase liquid, solid system, at a temperature from about 50° C. to about 350° C., and at pressures sufficient to maintain the solution in liquid form,

(b) separating the effluents from the treated oil-shale, wherein the resulting liquid effluent contains nitrogen moieties and sulfur moieties from the oil-shale and any resulting gaseous effluent contains nitrogen moieties from the oil-shale, and

(c) converting organic material of the treated oil-shale to shale-oil at a temperature from about 450° C. to about 550° C.

4,566,966

OCTANE CATALYTIC CRACKING PROCESS

Bernie J. Pafford, and Carl F. Bertsch, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 510,076, Jun. 30, 1983, abandoned. This application Aug. 28, 1984, Ser. No. 624,939

Int. Cl.⁴ C10G *11/00*

U.S. Cl. 208—113 **18 Claims**

1. In a method for cracking a hydrocarbon feedstock to lower molecular weight products in a cracking system comprising a reaction zone, a regeneration zone, and a passivation zone wherein:

(a) feedstock containing metal contaminant is passed to the reaction zone having cracking catalyst therein wherein the feedstock is cracked to lower molecular weight products and coke, coke and metal contaminant becoming deposited on the catalyst;

(b) coke and metal contaminated catalyst is passed from the reaction zone to a regeneration zone wherein coke is removed from the catalyst to regenerate the catalyst; and,

(c) regenerated catalyst from the regeneration zone is passed through a passivation zone prior to return to the reaction zone, the improvement comprising:

(i) monitoring the octane level of the cracked product; and

(ii) adjusting the metal contaminant level on the catalyst to maintain the octane level within a predetermined range by the addition to the cracking system of metal contaminated equilibrium cracking catalyst possessing a higher equivalent nickel content than the cracking catalyst in the reaction zone.

4,566,967

CATALYTIC REFORMING

Arthur W. Aldag, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1985, Ser. No. 708,143

Int. Cl.⁴ C10G *35/06*

U.S. Cl. 208—135 **16 Claims**

1. A process for the catalytic reforming of a feedstock which contains at least one reformable organic compound comprising the step of contacting said feedstock under suitable reforming conditions with a catalyst composition selected from the group consisting of a catalyst consisting essentially of zinc oxide and a spinel structure alumina and a catalyst consisting essentially of a physical mixture of zinc titanate and a spinel structure alumina in the presence of sufficient added hydrogen to substantially prevent the formation of coke, wherein insufficient zinc is present in said catalyst composition for the formation of a bulk zinc aluminate.

4,566,968

APPARATUS FOR LEADING OFF FROTH FROM THE TANK OF A FLOTATION CELL

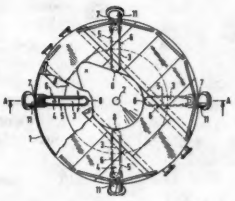
Tuomo V. J. Kivistö, Outokumpu; Kai B. Fallenius, and Timo U. Niitti, both of Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 545,616, Oct. 26, 1983, abandoned. This application Nov. 15, 1984, Ser. No. 671,801

Claims priority, application Finland, Nov. 16, 1982, 823919

Int. Cl.⁴ B01D *21/24*

U.S. Cl. 210—221.1 **10 Claims**



1. In combination, a flotation cell comprising a tank which has a wall, and apparatus for leading off froth from the tank, said apparatus comprising at least two launders placed inside the tank and each having a tubular lower part, means supporting the launders at respective support points close to the wall of the tank, and respective drain pipes connected to the tubular lower parts of the launders, the cell not including any member disposed within the tank above the launders and arranged to rotate in a horizontal plane in order to sweep froth into the launders.

9. In combination, a flotation cell comprising a tank which has a wall, and apparatus for leading off froth from the tank, said apparatus comprising at least one launder placed inside the tank and having a tubular lower part, means supporting the launder at a support point close to the wall of the tank in such a manner that the launder is turnable in a horizontal plane about a vertical axis through its support point, and a drain pipe connected to the tubular lower part of the launder.

4,566,969

ROLLING FILTER APPARATUS

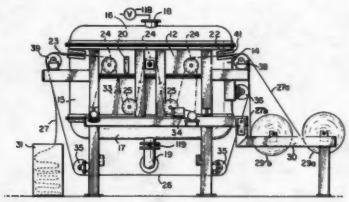
Max Klein, Schrewsbury, N.J., assignor to Crane & Co., Inc., Dalton, Mass., a part interest

Continuation-in-part of Ser. No. 482,618, Apr. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 306,694, Sep. 29, 1981, Pat. No. 4,394,146. This application Jan. 4, 1985, Ser. No. 689,019

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.⁴ B01D *33/32, 33/38*

U.S. Cl. 210—387 **17 Claims**



1. A rolling filter apparatus having

a filter chamber with an inlet for receiving liquid medium, an

outlet for discharging filtered liquid medium, said filter chamber having opposite side walls defining between them a path for the liquid medium from said inlet to said outlet;

a filter medium spanning across said filter chamber between said side walls and having opposite edge portions disposed adjacent the respective side walls, said filter medium comprising a carrier web and filter material, said carrier web extending continuously across the full width of the filter chamber between said side walls and having imperforate longitudinal marginal edge portions and a medial foraminous zone, said filter material covering said foraminous zone with its side edges overlying said marginal edge portions of the carrier web, and means to guide said medium in a predetermined path through said filter chamber;

said filter chamber having an entrance end and an exit end for said filter medium, and flange means projecting inwardly of said chamber from said sidewalls, said flange means being disposed on said opposite side walls in alignment with said predetermined path to underlie the edge portions of said filter medium and occupy the space between said filter medium and said side walls;

means to advance said filter medium longitudinally through said filter chamber from its entrance end to its exit end, said medium spanning between said flange means with the side edges of said filter medium overlying the free edges of said flange means; and

means to assemble the filter material of said filter medium onto said carrier web adjacent said entrance end of the chamber and feed the assembled filter medium into the filter chamber with the edges overlying the upstream surface of the flange means in intimate engagement therewith, whereby liquid medium flowing through said filter chamber must pass through said filter material in its travel from said inlet to said outlet;

said means to guide said filter medium including a first series of parallel turning rolls disposed at a first level across the liquid inlet of said chamber and a second series of parallel turning rolls disposed at a second level across the liquid outlet of said chamber, said turning rolls being positioned and arranged so that said predetermined path extends in upright zig-zag runs alternately between said turning rolls of the first and second series;

said inlet and outlet of said filter chamber having means to control the rates of flow through said inlet and outlet to maintain a reservoir of the liquid in the filter chamber having a liquid level above the upper ends of said upright zig-zag runs to completely immerse said upright runs.

4,566,970

WASHING MACHINE FILTER

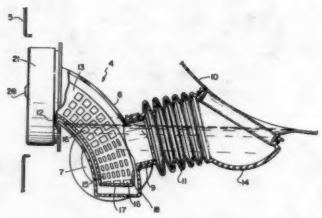
Dino Piai; Renzo Rigoni, and Giovanni Paruzzolo, all of Treviso, Italy, assignors to Industrie Zanussi S.p.A., Pordenone, Italy

Filed Apr. 26, 1984, Ser. No. 604,363

Claims priority, application Italy, May 5, 1983, 45713 A/83

Int. Cl.⁴ B01D *35/02*

U.S. Cl. 210—409 **3 Claims**



1. A washing machine filter for filtering water discharged from a washing machine, particularly a household washing machine, said filter comprising:

a filter housing having an open first end adapted to be mounted adjacent a wall of a washing machine and a closed second end, said housing having a first connection adapted to be connected to a wash tub of the washing machine to receive therefrom water to be filtered and a second connection adapted to be connected to a pump of the washing machine for discharging the washing water, said second connection having an upper edge;

a filtering body extending through said open first end and into the interior of said housing, said body having an outer end sealed to said housing and an inner end extending freely into said interior of said housing, and said body having therethrough filtering openings for filtering water passing between said first and second connections of said housing;

a shut-off cover removably connected to said outer end of said body for hermetically sealing said open first end of said housing;

said filter housing and said filtering body being curved and extending obliquely downwardly and away from said open first end and said outer end thereof, respectively;

said open first end of said housing being defined by an opening having a lower edge higher than said upper edge of said second connection, whereby upon removal of said cover water is prevented from overflowing from said housing through said opening;

said filtering openings in said body comprising smaller openings in the area of said body on a level with said second connection of said housing, and larger openings in other areas of said body; and

said interior of said housing including an upper portion for retaining an air pocket above the level of water in said housing, such that fibrous material floats on the surface of the water at a level above said second connection.

4,566,971

PROCESS AND APPARATUS FOR THE BIOLOGICAL PURIFICATION OF WASTEWATER

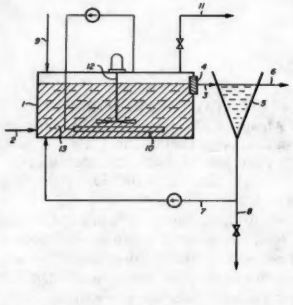
Hans Reimann, and Uwe Fuchs, both of Munich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 418,967, Sep. 16, 1982, abandoned. This application Jan. 24, 1985, Ser. No. 694,356

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137055

Int. Cl.⁴ C02F *3/08*

U.S. Cl. 210—616 **13 Claims**



1. In a process for the biological purification of wastewater containing organic impurities, wherein the wastewater is aerated in a reactor, in the presence of activated sludge in part carried on a carrier material comprising particles of organic polymer compounds, with a gas containing molecular oxygen, and the wastewater activated sludge mixture thereafter being

separated in a post-clarification stage into purified water and sludge with a partial stream of the thus-separated sludge being recycled into the reactor, the improvement comprising conducting the biological purification in the reactor in the presence of a carrier material comprising open cell macroporous particles having a specific gravity of 20–100 kg/m^3, a volume of 0.1–125 cm^3, a water absorption capacity of 30–70% after two minutes, a void ratio of 6–30 pores/cm, an air permeability of 150 to 350 l/dm^2/min at 10 mm water column differential pressure per 50 mm of thickness, and having open macropores of 0.1–3 mm, said reactor being a continuous flow-stirred tank with carrier particles present in the reactor in an amount comprising a volume proportion of 5–40% of the reactor volume to permit substantially free movement of the carrier particles suspended in the wastewater, to achieve decentralized growth of the organisms in the activated sludge on the particles and maintaining a solids concentration in the reactor of 6–15 g/l, sparging gas bubbles into the reactor from the bottom thereof of achieve circulation of the particles throughout the reactor, and recycling separated sludge from the post-clarification stage in an amount sufficient to maintain 0.9–9 kg/m^3 of free activated sludge in the reactor.

4,566,972

TREATMENT OF AQUEOUS SYSTEMS

John J. Bennison, Runcorn; Stuart W. Longworth, and John G. Baker, both of Warrington, all of England, assignors to Dearborn Chemicals, Ltd., Widnes, England

Continuation of Ser. No. 408,367, Aug. 16, 1982, abandoned. This application Jan. 15, 1985, Ser. No. 691,724

Claims priority, application United Kingdom, Aug. 18, 1981, 8125161

Int. Cl.^{4} C02F 5/12

U.S. Cl. 210—698 **6 Claims**

1. A method of treating water in an aqueous steam generating boiler system to inhibit calcium carbonate scale formation which comprises incorporating in the water ethylenediaminetetraacetic acid or a salt thereof and a water-soluble copolymer of maleic acid and styrene sulfonic acid or a salt thereof in a weight ratio of ethylenediametetracetic acid or salt to copolymer or salt of from 50:1 to 1:10, said copolymer possessing a molecular weight of from 1,000 to less than 10,000 and maleic acid and styrene sulfonic acid recurring units in a molar proportion of about 75:25 to 5:95.

4. A composition suitable for inhibition of calcium carbonate scale in an aqueous steam generating boiler system which comprises ethylenediaminetetraacetic acid or a salt thereof and a water-soluble copolymer of maleic acid and styrene sulfonic acid or a salt thereof possessing a molecular weight of from 1,000 to less than 10,000 and maleic acid and styrene sulfonic acid recurring units in a molar proportion of 75:25 to 5:95, said composition having a weight ratio of ethylenediaminetetraacetic acid or salt to copolymer or salt of from 50:1 to 1:10.

4,566,973

SCALE INHIBITION IN WATER SYSTEMS

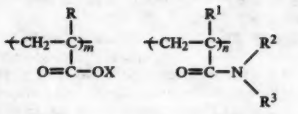
William F. Masler, III, Hinckley, and Zahid Amjad, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 6, 1984, Ser. No. 638,158

Int. Cl.^{4} C02F 5/12

U.S. Cl. 210—701 **15 Claims**

1. A method for inhibiting the precipitation of phosphate scale in an aqueous medium comprising the step of adding to the aqueous system about 0.05 to 500 ppm water-soluble noncrosslinked random copolymer of 50 to 90 weight parts of an acrylic acid and 10 to 50 weight parts of a substituted acrylamide, on the basis of a total of 100 weight parts of polymerized monomers, said copolymer having weight average molecular weight in the range of about 1,000 to 50,000 and the polymerized units of an acrylic acid and a substituted acrylamide are defined by the following formula:



where m is in the range of about 10 to 700 and n is in the range of about 0.1 to 350, subject to the molecular weight limitations; R and R^1 are individually selected from hydrogen and methyl; X is selected from hydrogen, sodium, potassium, calcium, ammonium, and magnesium moieties; and R^2 and R^3 are individually selected from hydrogen, and substituted and unsubstituted groups each containing a total of 1 to 8 carbon atoms, wherein the substituents on R^2 and/or R^3 are selected from alkyl, aryl, and keto groups, provided that either R^2 and/or R^3 is other than hydrogen.

4,566,974

METHOD OF INHIBITING SCALE WITH COPOLYMER

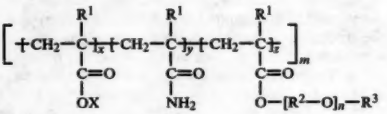
William F. Masler, III, Hinckley, and Zahid Amjad, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 508,636, Jun. 28, 1983, Pat. No. 4,499,002. This application Dec. 24, 1984, Ser. No. 685,279

Int. Cl.^{4} C02F 5/12

U.S. Cl. 210—701 **7 Claims**

1. A method for inhibiting the deposition of scale due particularly to calcium phosphate and magnesium phosphate formed in a system for treating process water, comprising, adding to said process water from 2 parts per million (ppm) to about 200 ppm of a water-soluble essentially non-crosslinked random copolymer consisting essentially of a copolymer of acrylic acid or methacrylic acid, acrylamide or methacrylamide, and an alkoxyalkyl primary alcohol ester of (meth)acrylic acid, the copolymer having the structural formula



wherein,

X represents H, or NH_4, or an alkali metal selected from the group consisting of sodium and potassium;

R^1 represents H, or methyl;

R^2 represents lower alkyl having from 2 to about 4 carbon atoms;

R^3 represents lower alkyl having from 1 to about 10 carbon atoms;

n is an integer in the range from 2 to about 6;

m is an integer in the range from about 3 to about 70; and,

for each y (that is, y=1) x is an integer in the range from about 1 to about 8, and z is a number in the range from 1 to about 0.075; and x, y and z are present in relative heterogeneous order.

4,566,975

METHOD FOR PURIFYING AQUEOUS SOLUTIONS

Torkel Allgulin, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 12, 1984, Ser. No. 649,712

Claims priority, application Sweden, Sep. 12, 1983, 8304858

Int. Cl.^{4} C02F 1/52

U.S. Cl. 210—711 **12 Claims**

1. A method for purifying an aqueous solution including at least one of arsenic and phosphorous and containing an impurity selected from the group consisting of mercury, heavy

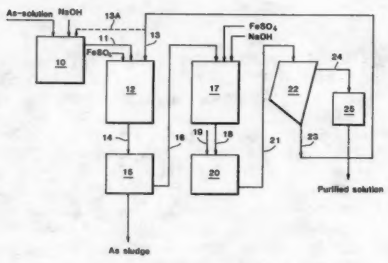
metals, solid matter and mixtures thereof which impurity is capable of being precipitated in a plurality of precipitating stages comprising:

(a) supplying the aqueous solution and precipitating agent comprised of metal ions capable of forming a substantially insoluble hydroxide precipitate to a first precipitating stage wherein the aqueous solution and precipitating agent are mixed at a pH of at least 9 and a precipitate is formed;

(b) separating at least a portion of the precipitate formed in the first precipitating stage containing a portion of the arsenic and/or phosphorus and impurity from the aqueous solution and removing said portion from the aqueous solution;

(c) transferring the aqueous solution to a last precipitating stage;

(d) adding precipitating agent comprised of metal ions capable of forming a substantially insoluble hydroxide precipitate to the aqueous solution in the last precipitating stage at a pH between about 8 and 9 whereby a precipitate is formed;



(e) separating the precipitate formed in the last precipitating stage containing a further portion of the arsenic and/or phosphorus impurity from the aqueous solution wherein substantially purified aqueous solution is obtained;

(f) recycling the precipitate from step (e) to step (a) such that the amount of metal ions in the precipitate is greater than the amount of metal ions supplied by the precipitating agent of step (a) wherein the amount of precipitating agent added to the last precipitating stage is selected such that the ratio of equivalents of precipitating agent to moles of arsenic and/or phosphorus and impurity in the last precipitating stage is at least 2:1 and wherein said ratio in the first precipitating stage is at least 0.8:1 and is less than said ratio in the last precipitating stage.

4,566,976

VISCOUS HEAVY BRINES

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Continuation of Ser. No. 330,242, Dec. 14, 1981, Pat. No. 4,459,214. This application Jun. 20, 1984, Ser. No. 622,696

Int. Cl.[4] C09K *7/02*; E21B *43/00*

U.S. Cl. 252—8.5 A **4 Claims**

1. A method of increasing the viscosity of a heavy brine solution containing one or more solouble salts selected from the group consisting of calcium chloride, calcium bromide, zinc bromide, and mixtures thereof, and which has a density greater than about 13.5 ppg, which comprises adding to said solution a viscosity increasing amount of a viscosifier selected from the class consisting of (1) hydroxyethyl cellulose, a solvating agent comprising a water miscible, polar organic liquid which when uniformly mixed with hydroxyethyl cellulose in a weight ratio of hydroxyethyl cellulose to solvating agent of 1:2 produces a mixture with substantially no free liquid solvating agent present after remaining quiescent for one week at ambient temperature in a sealed container, and a diluting agent comprising an organic liquid which is not a solvating agent; and (2) hydroxyethyl cellulose, a water soluble organic liquid, and an aqueous liquid, the organic liquid when uniformly mixed with the HEC in a weight ratio of HEC to organic liquid of 1:2 produces a mixture with free liquid present after remaining quiescent for one week at ambient temperature in a sealed container, the aqueous liquid having a pH greater than about 7.0, and from about 0.1 to about 7.0 pounds per 42 gallon barrel of sequestrant selected from the group consisting of polyhydroxy carboxylic acids and the water soluble salts thereof.

4,566,977

NON-AQUEOUS SLURRIES USED AS THICKENERS

James C. Hatfield, St. Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 391,954, Jun. 24, 1982, abandoned, which is a continuation of Ser. No. 190,906, Sep. 25, 1980, abandoned. This application Feb. 28, 1985, Ser. No. 706,725

Int. Cl.[4] C09K *7/02*; E21B *43/00*

U.S. Cl. 252—8.5 C **24 Claims**

1. A non-aqueous slurry suitable for use as a thickener or viscosifier in oil or gas drilling, fracturing, flow diversion, completion or workover aqueous fluids, which slurry consists essentially of:

(1) from about 1 to about 60 weight percent of a hydroxyethyl substituted, water-soluble cellulose ether polymer;

(2) from about 20 to about 95 weight percent of a water-insoluble liquid hydrocarbon;

(3) from 1 to about 10 weight percent of a non-ionic surfactant having an HLB of from about 7 to 14, represented by the structural formula:

$$R(OCH_2CH_2)_nOH$$

wherein:

R is an alkyl or aryl radical containing from 7 to about 20 carbon atoms, and

n is from 1 to about 15; and

(4) from 1 to about 4 weight percent of an organo modified colloidal clay.

4,566,978

HIGH TEMPERATURE DRILLING FLUIDS

Randel E. Stong, Gales Ferry, and Stanley W. Walinsky, Mystic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 21, 1984, Ser. No. 612,280

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.5 C **12 Claims**

1. An aqueous drilling fluid suitable for high-temperature use comprising a water base, clay suspended in said base and from about 0.01–25 pounds per barrel total composition of a hydrolyzed terpolymer of maleic anhydride, styrene and a third monomer selected from acrylamide, methacrylamide, acrylic acid and methacrylic acid, the molar ratio of maleic anhydride to styrene to said third monomer being from about 30:10:60 to 50:40:10, and the alkali metal, ammonium and lower aliphatic amine salts thereof, the weight-average molecular weight of said hydrolyzed terpolymer being from about 500–10,000.

5. An aqueous drilling fluid suitable for high-temperature use comprising a water base, clay suspended in said base and from about 0.01–25 pounds per barrel total composition of a hydrolyzed copolymer of maleic anhydride and a second monomer selected from acrylamide, methacrylamide, acrylic acid and methacrylic acid, the molar ratio of said maleic anhydride to said second monomer being from about 25:75 to 75:25, and the alkali metal, ammonium and lower aliphatic amine salts thereof, the weight-average molecular weight of said hydrolyzed copolymer being from about 500–10,000.

4,566,979

STABLE MIXTURE OF CROSSLINKABLE COMPONENTS PROMPTLY ACTIVATABLE AS ACTING TREATING AGENTS

Charles J. Githens, 1604 N. Ridge Dr., Duncan, Okla. 73533, assignor to Charles J. Githens, Duncan, Okla.

Filed Nov. 7, 1983, Ser. No. 549,283
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—8.55 C 10 Claims

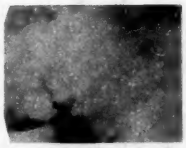
1. A storable dry mixture of readily activatable crosslinking components, said components comprising a dry, powdered mixture of SC-Composition and SH-Gelling Agent, said components made quickly activatable by addition of non-acidic water to form a gel, storable for at least a day, and the addition of acidic aqueous solution to effect quick crosslinking to form an active acidic treating fluid.

4,566,980

CARPET TREATING COMPOSITION

James A. Smith, Old Tappan, N.J., assignor to Creative Products Resource Associates, Ltd., Clifton, N.J.

Filed Jan. 16, 1985, Ser. No. 692,646
Int. Cl.[4] D06M *11/00*
U.S. Cl. 252—8.6 31 Claims



1. A dry-type carpet treating composition comprising base particles of an inorganic carrier salt and an agglomerating agent, said base particles having applied thereto a polymeric coating comprising a film-forming latex and an amount of wax effective to substantially maintain the structural integrity of the base particles upon contact with water while not substantially inhibiting their ability to absorb said water.

4,566,981

FLUOROCHEMICALS AND FIBROUS SUBSTRATES TREATED THEREWITH: COMPOSITIONS OF CATIONIC AND NON-IONIC FLUOROCHEMICALS

Richard D. Howells, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 30, 1984, Ser. No. 595,349
Int. Cl.[4] C08F *12/20*
U.S. Cl. 252—8.8 15 Claims

1. A fluorochemical composition comprising a mixture of

(a) a cationic fluorochemical having one or more monovalent fluoroaliphatic radicals having at least three fully fluorinated carbon atoms, one or more N-containing moieties selected from carbodiimido, urylene, and carbonylimino, said radicals and moieties being bonded together by hetero atom-containing or organic linking groups, said linking groups being free of active hydrogen atoms, and an organo amino nitrogen derived cationic moiety, said cationic moiety bonded to said N-containing moiety by hetero atom-containing or organic linking groups, and

(b) a non-ionic fluorochemical having one or more monovalent fluoroaliphatic radicals, having at least three fully fluorinated carbon atoms, and one or more N-containing moieties selected from carbodiimido, urylene, and carbonylimino, said radicals and moieties bonded together by hetero atom-containing or organic linking groups, said linking groups being free of active hydrogen atoms.

4,566,982

METAL DITHIOBENZOATES AS LUBRICANT ADDITIVES

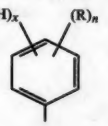
Jacob J. Habeeb, Sarnia, Canada, and Keith Coupland, South Cliffe, England, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 395,596, Jul. 6, 1982, Pat. No. 4,456,509. This application Jan. 4, 1984, Ser. No. 568,055
Int. Cl.[4] C10M *1/54, 1/38*
U.S. Cl. 252—33.6 5 Claims

1. A lubricating hydrocarbon composition containing about 0.0001 to about 5.0 percent by weight of a metal dithiobenzoate having the formula:

$$[\phi C(S)S]_2M \quad (I)$$

where M is a metal of Groups IIA, IIIA, and IVA or a transition metal of the Periodic Table having a valence of 2 and ϕ has the structure:



where R is an alkyl of 1 to 18 carbons, n is 2 and x is 1, where the OH is in the 4 position from the open branch and where the R groups are in the 3 and 5 position from the open branch.

4,566,983

COMBINATION OF CARBOXYLIC ACYLATING AGENTS SUBSTITUTED WITH OLEFIN POLYMERS OF HIGH AND LOW MOLECULAR WEIGHT MONO-OLEFINS, DERIVATIVES THEREOF, AND FUELS AND LUBRICANTS CONTAINING SAME

Katsumi Hayashi, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 623,270, Jun. 21, 1984, Pat. No. 4,509,955, which is a division of Ser. No. 404,848, Aug. 9, 1982, Pat. No. 4,471,091. This application Feb. 7, 1985, Ser. No. 699,103
The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.
Int. Cl.[4] C10M *147/04*
U.S. Cl. 252—56 R 32 Claims

1. A composition comprising

(A) the reaction product of

(A)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(A)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of monoolefins of from 12 to 30 carbon atoms, and chlorinated or brominated analogs thereof; and

(B) the reaction product of

(B)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(B)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-1-olefins of from 2 to 8 carbon atoms and chlorinated or brominated analogs thereof.

17. A lubricant composition comprising a major amount of oil of lubricating viscosity and a minor amount of a composition comprising:

(A) The reaction product of

(A)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(A)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-olefins of from 12 to 30 carbon atoms, and chlorinated or brominated analogs thereof; and

(B) the reaction product of

(B)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(B)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-1-olefins of from 2 to 8 carbon atoms and chlorinated or brominated analogs thereof.

4,566,984

ETHER POLYCARBOXYLATES

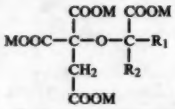
Rodney D. Bush, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 16, 1984, Ser. No. 672,302

Int. Cl.[4] C07C *59/22, 69/66*

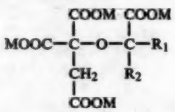
U.S. Cl. 252—140 **8 Claims**

1. Metal sequestering agent compounds represented by the chemical structure



wherein M is hydrogen or a cation wherein the resultant salt is water-soluble and R_1 and R_2 can be the same or different and are selected from the group consisting of H, CH_3, CH_3CH_2, OH, CH_2OH, CH_2CH_2OH, COOM, CH_2COOM, and CH_2CH_2COOM, M having the same meaning as above.

4. A detergent composition comprising from about 0.5% to about 98% by weight of a surfactant and from about 2% to about 99.5% by weight of a metal sequestering agent compound represented by the chemical structure



wherein M is hydrogen or a cation wherein the resultant salt is water-soluble and R_1 and R_2 can be the same or different and are selected from the group consisting of H, CH_3, CH_3CH_2, OH, CH_2OH, CH_2CH_2OH, COOM, CH_2COOM, and CH_2CH_2COOM, M having the same meaning as above.

4,566,985

METHOD OF CLEANING USING LIQUID COMPOSITIONS COMPRISING STABILIZED MIXTURES OF ENZYMES

Leonard C. Bruno, Menomonee Falls, and Mark M. Bruno, Milwaukee, both of Wis., assignors to Applied Biochemists, Inc., Milwaukee, Wis.

Filed Sep. 19, 1984, Ser. No. 651,890

Int. Cl.[4] C11D *7/42;* D06M *16/00*

U.S. Cl. 252—174.12 **5 Claims**

1. A method of cleaning, comprising the steps of preparing a liquid enzyme composition having a water base and containing a mixture of enzymes dissolved in said water base, said enzymes including a protease and at least one other enzyme, said composition also including a benzamidine hydrohalide dissolved in said water base and present in a concentration at least equal to 0.003 molar solution, said benzamidine hydrohalide inhibiting the digestive effect of said protease on said other enzyme, diluting the composition with an additional quantity of water to reduce the concentration of said benzamidine hydrohalide to a value substantially less than 0.003 molar solution, and thereafter contacting the article to be cleaned with said diluted composition.

4,566,986

FLOCCULATING AGENTS AND PROCESSES FOR MAKING THEM

John J. Waldmann, 2129 Knickerbocker Dr., Charlotte, N.C. 28212

Filed Aug. 31, 1984, Ser. No. 646,012

Int. Cl.[4] C02F *5/08;* C01F *7/16, 7/74*

U.S. Cl. 252—175 **21 Claims**

2. A process for making a flocculating adduct adapted for use in purification of liquids, comprising, in the order given, the steps of:

(a) charging a reaction vessel with a mixture of (1) from about 10 to about 20 mole percent of deionized water and (2) from about 2 to about 8 mole percent of alumunium oxide hydrate;

(b) heating the mixture, under agitation, to about 45° C.;

(c) adding from about 0.2 to 3.0 mole percent of sulfuric acid to the mixture over a period of about 40 minutes while maintaining the temperature of the mixture below about 110° C.;

(d) adding (1) from about 3.0 to about 10 mole percent of sulfuric acid and (2) from about 12 to about 25 mole percent of deionized water to the mixture and maintaining the temperature of the mixture between about 95° C. and about 110° C. for about 120 minutes; and

(e) adding from about 1 mole percent to about 5 mole percent of magnesium hydroxide to the mixture and maintaining the temperature of the mixture between about 85° C. and 95° C. for about 30 minutes.

4,566,987

SCINTILLATION GLASS

Georg Gliemeroth, Mainz-Finthen; Burkhard Speit, Mainz-Mombach, and Hans-Georg Krolla, Mainz, all of Fed. Rep. of Germany, assignors to Schott-Glaswerke, Mainz, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 504,906

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222567

Int. Cl.[4] C09K *11/463, 11/475;* C03C *3/10*

U.S. Cl. 252—301.4 F **9 Claims**

1. An essentially colorless, cerium- and phosphorous-containing barium silicate glass, of a density >3.3 g/cm², a radiation length <43.5 mm, with strong fluorescence at 415–430 nm and with good scintillation properties, consisting essentially of (in percent by weight):

SiO_2	20–60	} - 21–60
B_2O_3	0–18	
P_2O_5	1–10	
Li_2O	0–10	
Na_2O	0–10	
K_2O	0–15	
MgO	0–10	
SrO	0–12	
BaO	30–60	} - 30–60
La_2O_3	0–10	
Ce_2O_3	0.5–8	
(a) other oxides which are radiation-length shortening oxides		} 0–20
(b) refining agents		
(c) other oxides which are UV-absorption edge adjusting oxides		
(d) other conventional components which are scintillating sensitizers,		
Al_2O_3	0–2	

-continued

CaO	0–4.

4,566,988

PROCESS FOR THE OXIDATION OF GASEOUS HYDROCARBONS

Ronald A. Schneider, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 21, 1984, Ser. No. 591,751
Int. Cl.[4] C01B *3/34*
U.S. Cl. 252—373 12 Claims

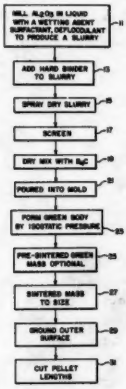
1. A process for the oxidation of natural gas which comprises contacting the natural gas with an oxidant comprising Ga_2O_3.

4,566,989

BURNABLE NEUTRON ABSORBERS

Kenneth C. Radford, Churchill, and William G. Carlson, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 26, 1982, Ser. No. 352,731
Int. Cl.[4] G21C *7/04, 21/18*
U.S. Cl. 252—478 8 Claims



1. The method of making burnable neutron-absorber bodies for the burnable-poison assemblies of a nuclear reactor which comprises:

(a) producing a slurry of a powder of a refractory material including one or more of the class consisting of Al_2O_3 and ZrO_2;

(b) adding a binder to said slurry;

(c) drying said slurry to produce a powder of agglomerated particles of one or more of the class of Al_2O_3 and ZrO_2 including said binder;

(d) mixing said powder with a powder of the class of neutron-absorbers consisting of elements or compounds of boron, gadolinium, samarium, cadmium, europium, hafnium, dysprosium and indium, to form a mixture of said powders;

(e) isostatically compressing said mixture to form a green body;

(f) sintering said green body to form a sintered body; and

(g) forming said sintered body into a neutron-absorber body of appropriate shape and dimensions.

7. A burnable neutron-absorber body for use in the burnable-poison assemblies of a nuclear reactor, said body being formed of a porous matrix of Al_2O_3, said matrix including high-density polycrystalline particles of Al_2O_3 juxtaposed to pores in which pores there are particles of B_4C.

4,566,990

SYNERGISTIC EFFECT OF METAL FLAKE AND METAL OR METAL COATED FIBER ON EMI SHIELDING EFFECTIVENESS OF THERMOPLASTICS

Nan-I Liu, Mt. Vernon, Ind., and Roelof van der Meer, Bergen op Zoom, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 25, 1983, Ser. No. 545,339
Claims priority, application Netherlands, Nov. 5, 1982, 8204288
Int. Cl.[4] C08K *7/06, 7/14, 7/00*
U.S. Cl. 252—503 37 Claims

1. A thermoplastic polymeric composition having high electromagnetic interference shielding effectiveness comprising:

(a) a thermoplastic resin or resin blend,

(b) from about 25 to about 50% by weight based on the total composition of metal flake, and

(c) from about 2 to about 12% by weight based on the total composition of metal or metal coated fiber,

wherein the weight ratio of flake to fiber is from about 4:1 to about 14:1.

27. The composition of claim 1 wherein the metal coated fibers are selected from the group consisting essentially of metal coated glass and carbon fibers.

30. The composition of claim 27 wherein the metal coated fiber is nickel coated graphite fiber.

4,566,991

PROCESS FOR PREPARING CONDUCTING POLYMERIC COMPOSITIONS

John P. Sibilia, Livingston, N.J.; Hyo-gun Kim, Pittsford, N.Y., and Arthur R. Paterson, Morristown, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 2, 1982, Ser. No. 394,752
Int. Cl.[4] H01B *1/02*
U.S. Cl. 252—512 21 Claims

1. A process for improving the anti-static properties of polymer compositions, which comprises:

(a) forming a polymeric composition comprising an intimate mixture of one or more first metal salts and one or more polymers, each of said first metal salts being reactive with a reagent selected from the group consisting of:

(1) a mixture of vapors of a solvent which is capable of leaching at least one of said first metal salts from said composition and gaseous carbon dioxide;

(2) a mixture of said vapors and gaseous hydrogen sulfide;

(3) a solution comprising hydrogen sulfide and said solvent;

(4) a solution comprising carbonate ions and said solvent; and

(5) a combination of one or more of the reagents of subparagraphs 1,2,3, and 4, hereof to form the corresponding carbonate, sulfide, or oxide salt of said first metal salt, said corresponding carbonate, sulfide or oxide salt having an electrical resistivity which is less than the electrical resistivity of said one or more polymers, and being substantially insoluble in said solvent; and

(b) treating said composition with one or more of said reagents, thereby leaching said one or more first metal salts out of said one or more polymers such that said first metal salts react with said reagent forming said corresponding carbonate, sulfide or oxide salts thereof on, in or on and in the surface of said one or more polymers in an amount sufficient to decrease the electrical resistivity of said polymers.

4,566,992

SOLUTIONS FOR THE FUSION OF ONE METAL TO ANOTHER

Ady Joseph, Islington; Lily Mayer, Etobicoke, and Alexander Miutel, Toronto, all of Canada, assignors to Metafuse Limited, Ontario, Canada

Filed Dec. 28, 1981, Ser. No. 335,282
Int. Cl.[4] H01B *1/14*
U.S. Cl. 252—518 19 Claims

1. A solution for the fusion of a second metal to a first metal consisting essentially of:

0.10 to 10% by weight of a first compound including said second metal in a dissociable polyvalent form;

0.30 to 10% by weight of a second compound capable of complexing with the first compound, the first compound and the second compound being either soluble in water or forming a complex which is soluble in water;

0.1 to 0.5% by weight of a stabilizing agent which maintains the first compound, the second compound and the complex thereof in solution;

0.1 to 0.5% by weight of a catalyzer for promoting the speed of reaction, reducing the valency of the polyvalent form of said second metal to a lower valency and catalyzing complexing action between the first and second compound; and

the remainder a solvent selected from the group consisting of water, an organic solvent or a mixture thereof whereby said solution has a resistivity in the range of 10 to 80 ohms cm at room temperature.

4,566,993

LIQUID DETERGENTS CONTAINING CELLULOSE ETHERS STABILIZED BY GLYCEROL

Isaac I. Secemski, Flushing, and Joseph J. Podgorsky, Slate Hill, both of N.Y., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.

Filed Jun. 15, 1984, Ser. No. 621,288
Int. Cl.[4] C11D *1/12, 1/755*
U.S. Cl. 252—559 14 Claims

1. An aqueous liquid detergent composition comprising:

(1) from about 0.5% to about 2% glycerol;

(2) from about 0.05% to about 1% cellulose ether;

(3) from about 3% to about 6% of a nonionic surfactant; and

(4) from about 10% to about 25% of an anionic surfactant

wherein each of said components are based by weight on 100 percent of the total composition; and the balance being water.

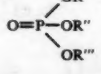
4,566,994

FLAME-RETARDANT ELECTRICAL INSULATING OIL COMPOSITION

Hiroshi Hasegawa; Akira Shinzawa, and Yoshiki Kohno, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Jun. 6, 1983, Ser. No. 501,294
Claims priority, application Japan, Jun. 10, 1982, 57-99747
Int. Cl.[4] H01B *3/24*
U.S. Cl. 252—574 12 Claims

1. A flame retardant electrical insulating oil composition comprising 100 parts by volume of the insulating oil and 5 to 80 parts by volume of a halogen-containing phosphoric ester of the formula



in which R', R'' and R''' are residues of halogenated hydrocarbon wherein said halogenated hydrocarbon residue is $—CH_2X$, $—CH_2CH_2X$, $—CH(CH_3)CH_2X$, $—CH(CH_3)CHX_2$, $—C_6H_4CH_2X$ or $—C_6H_4CHX_2$, where X represents a halogen atom.

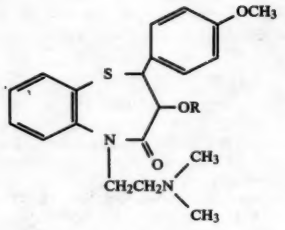
4,566,995

PROCESS FOR THE PREPARATION OF BENZOTHIAZEPINE DERIVATIVES

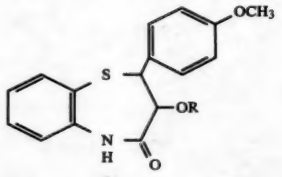
Chaim Simonovitch, Rishon Letzion; Theodor Hoffman, Netanya, and Sabar Sasson, Rehovoth, all of Israel, assignors to ABIC Ltd., Israel

Filed Apr. 1, 1985, Ser. No. 718,100
Claims priority, application Israel, Apr. 13, 1984, 71538
Int. Cl.[4] C07D *281/02*
U.S. Cl. 260—239.3 B 11 Claims

1. A process for the preparation of benzothiazepine derivatives of general formula I



wherein R stands for hydrogen and acetyl or of acid addition salts thereof in which a corresponding compound of general formula II



in which R has the same meaning as above is reacted with 2-(dimethylamino)-ethyl chloride in a biphasic system of water and a non-combustible aliphatic polychlorinated hydrocarbon solvent in the presence of calcium hydroxide or of barium hydroxide.

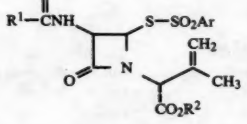
4,566,996

PROCESS FOR PREPARING AZETIDINONE DERIVATIVES

Sigeru Torii; Hideo Tanaka, both of Okayama; Takashi Shiroi, Tokushima; Michio Sasaoka, Tokushima; Norio Saito, Tokushima, and Kiyotoshi Matsumura, Tokushima, all of Japan, assignors to Otsuke Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Jan. 3, 1984, Ser. No. 567,736
Claims priority, application Japan, Jan. 19, 1983, 58-7630
Int. Cl.[4] C07D *205/08, 405/12*
U.S. Cl. 260—239 A 8 Claims

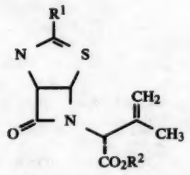
1. A process for preparing an azetidinone derivative represented by the formula



(1)

wherein R^1 represents phenyl, p-nitrophenyl, p-chlorophenyl,

phenylmethyl, p-nitrophenylmethyl, p-chlorophenylmethyl, diphenylmethyl, phenyldichloromethyl, phenylhydroxymethyl, phenoxymethyl, p-chlorophenoxymethyl or p-methoxyphenoxymethyl, R^2 represents a hydrogen atom or a group for protecting carboxylic acid, and Ar represents phenyl, p-methylphenyl, p-chlorophenyl, p-nitrophenyl, p-methoxyphenyl or 2,4-dinitrophenyl, the process comprising reacting a thiazolineazetidinone derivative represented by the formula


(2)

wherein R^1 and R^2 are as defined above with a sulfonyl bromide represented by the formula

$$Ar—SO_2—Br \quad (3)$$

wherein Ar is as defined above in water-containing organic solvent.

4,566,997

PROCESS FOR PREPARING RESIN METAL SALTS

Hisatake Satoh, Yokohama, and Shinichi Ota, Tokyo, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1984, Ser. No. 570,525

Claims priority, application Japan, Jan. 17, 1983, 58-5669

Int. Cl.⁴ C09F *9/00*; C08F *4/00*

U.S. Cl. 260—105 **6 Claims**

1. A process for preparing a resin metal salt characterized in that a resin containing an anhydride group and having a molecular weight ranging from 250 to 5000 in a state of a solution in a solvent is reacted with a hydroxide, oxide, or carbonate of a divalent metal in the presence of ammonia or an amine.

4,566,998

PRODUCTION OF HYDROGEN PEROXIDE

Victor M. Ochoa, and Ricardo Pueyo, both of La Zaida, Spain, assignors to Foret S.A., Barcelona, Spain

Filed Sep. 28, 1981, Ser. No. 306,101

Int. Cl.⁴ C07C *50/18*

U.S. Cl. 260—369 **10 Claims**

1. In a process of producing hydrogen peroxide by alternately hydrogenating and oxidizing an anthraquinone working solution, in which said working solution is regenerated by contacting the solution with an activated alumina, the improvement which comprises regenerating anthraquinone degradation products in said working solution by contacting a mixture containing both hydrogenated working solution and oxidized working solution with an alkaline activated alumina at a temperature of about 125° C. to 160° C., said alkaline activated alumina containing about 2.5 to 5% by wt. of Na_2O, and thereby regenerating anthraquinone-derived degradation products in said working solution.

4,566,999

PROCESS FOR THE PREPARATION OF ACID DYESTUFFS OF LOW ELECTROLYTE CONTENT OF THE TRIPHENYLMETHANE SERIES

Axel Engelmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

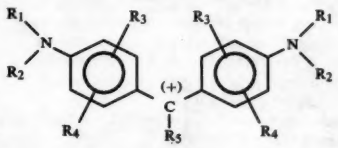
Filed Mar. 15, 1984, Ser. No. 589,883

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309726

Int. Cl.⁴ C09B *11/10, 11/6*

U.S. Cl. 260—392 **3 Claims**

1. A process for the preparation of a triphenylmethane dyestuff of low electrolyte content, of the formula (A)


(A)

in which R_1 and R_2 each denote a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, a benzyl group or a sulfobenzyl group, R_3 and R_4 each denote a hydrogen atom, an alkyl group of 1 to 4 carbon atoms or a sulfonic acid group and R_5 denotes a phenyl, chlorophenyl, dialkylaminophenyl, alkyldialkylaminophenyl, alkoxyphenylaminophenyl, sulfanilido, sulfanilidophenyl, disulfobenzylaminophenyl, sulfophenyl disulfophenyl, disulfohydroxyphenyl, sulfonaphthyl, disulfonaphthyl, hydroxydisulfonaphthyl or alkylphenylaminosulfonaphthyl group, with the proviso that the dyestuff molecule contains at least one sulfonic acid group, can be prepared in the form of its ammonium or alkaline earth metal salts, which comprises dissolving each mole of the corresponding leuco-compound of the dyestuff of the formula (A) with n−1 moles of aqueous ammonia solution or n−1 moles of a mixture of aqueous ammonia solution and an aqueous alkali metal hydroxide solution, n representing the number of $—SO_3^{\ominus}$-groups contained in the molecule of the said leuco compound, and then (a) establishing a pH value of 1–4.5 by addition of phosphoric acid and subsequently adding an aqueous suspension of about 100 to about 120 mole % based on this amount of leuco compound of manganese dioxide, or

(b) initially adding an aqueous suspension of about 100 to about 120 mole % based on the amount of leuco compound of manganese dioxide and then establishing a pH value of 1–4.5 by addition of phosphoric acid, or

(c) allowing the solution of the leuco-compound together with an aqueous suspension of about 100 to about 120 mole % based on the amount of leuco compound of manganese dioxide to run into the phosphoric acid, which has been initially introduced into the reaction vessel, in such an amount that the pH value of the mixture is 1 to 4.5,

it being necessary in each case for at least the equimolar amount, based on the manganese dioxide, of ammonia to be present, and subsequently oxidizing the leuco-compound at temperatures between 0° to 100° C. to give the corresponding triphenylmethane dyestuffs.

4,567,000

11-DIFLUOROMETHYLENE STEROIDS

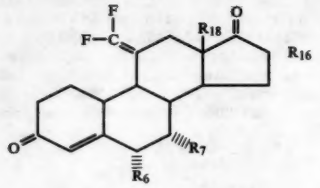
Donald E. Ayer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 31, 1984, Ser. No. 646,605

Int. Cl.⁴ C07J *1/00*

U.S. Cl. 260—397.3 **24 Claims**

1. A 11-difluoromethylene steroid of the formula



(V)

where

R_6 is a hydrogen atom or methyl group with the proviso that when R_6 is a methyl group, R_7 is a hydrogen atom;

R_7 is a hydrogen atom or methyl group with the proviso that when R_7 is a methyl group, R_6 is a hydrogen atom;

R_{16} is a hydrogen atom or methyl or ethyl group;

R_{18} is a methyl or ethyl group; and

~ indicates that the attached group can be in either the α or β configuration.

4,567,001

16-METHYLENE-17α-HYDROXY-PROGESTERONES

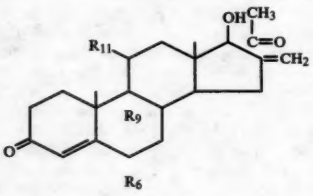
Verian H. VanRheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 419,668, Sep. 20, 1982, abandoned. This application Jun. 3, 1983, Ser. No. 501,032

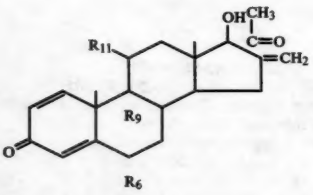
Int. Cl.⁴ C07J 5/00, 1/00

U.S. Cl. 260—397.3 **79 Claims**

1. A 17β-hydroxy steroid selected from the group consisting of

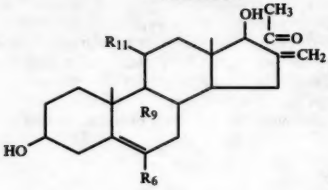


(VAA)



(VB)

-continued



(VC)

and C_3 protected forms thereof where

R_6 is a hydrogen or fluorine atom, methyl or methylene group, when R_6 is methylene, there are no 6–7 double bonds in formula (A) or 5–6 double bonds in formula (C);

R_9 is nothing or a hydrogen or fluorine atom, which includes the $\Delta 9(11)$ and $9\beta,11\beta$-epoxide functionality;

R_{11} is nothing or a hydrogen or oxygen atom, an α-hydroxy group, or a β-hydroxy group, which includes the $\Delta 9(11)$ and $9\beta,11\beta$-epoxide functionality;

~ indicates that the attached atom or group can be in either the α or β configuration; and

___ is a single or double bond.

4,567,002

PROCESS FOR THE PREPARATION OF 17-HALOETHYNYL STEROIDS, AND NOVEL 17-HALOETHYNYL STEROIDS

Helmut Hofmeister; Henry Laurent; Klaus Annen, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

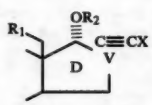
Filed Apr. 25, 1984, Ser. No. 603,855

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3315324

Int. Cl.⁴ C07J 5/00

U.S. Cl. 260—397.4 **11 Claims**

1. A process for preparing a 17-haloethynyl androstane or estrane of the partial formula



wherein

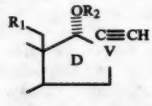
R_1 is hydrogen or methyl,

R_2 is alkyl of 1–4 carbon atoms, alkanoyl of 1–7 carbon atoms, trimethylsilyl, 2-tetrahydropyranyl, or nitrate,

X is bromine or iodine, and

V is methylene, ethylene, ethylidene, vinylene, vinylidene, or cyclopropylene,

comprising treating a corresponding ethynyl androstane or estrane of the partial formula



wherein R_1, R_2, and V are as defined above, in a reaction compatible solvent with an effective brominating agent or iodinating agent in the presence of a catalytically effective amount of silver cations.

4,567,003

2,3-DIBROMO-PENTAFLUOROPROPYL FLUOROSULFATE

Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1984, Ser. No. 592,919
Int. Cl.[4] C07C *141/02*
U.S. Cl. 260—458 F 1 Claim

1. A compound having the formula $CF_2BrCFBrCF_2OSO_2F$.

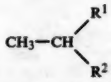
4,567,004

PROCESS FOR THE PREPARATION OF MONOMETHYL-SUBSTITUTED METHYLENE COMPOUNDS

Heinz U. Blank, Odenthal, and Erich Wolters, Niederzier, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 632,134
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326635
Int. Cl.[4] C07C *121/66, 121/20, 121/34, 121/407*
U.S. Cl. 260—465 R 23 Claims

1. A process for the preparation of a monomethyl-substituted methylene compound of the formula



which comprises contacting a methylene compound of the formula

wherein

R^1 and R^2 independently of one another represent —CN, —CO—R^3, —SO_2—R^3 and —NO_2 and

R^1 can additionally denote —aryl $(R^1)_n$,

wherein

R^3 denotes —OH, alkyl, aralkyl, aryl, alkoxy, aralkoxy or aryloxy, or amino which is unsubstituted or substituted by alkyl and/or aralkyl and/or aryl, and furthermore two radicals R^3 together can be an alkylene group, the radical of an aliphatic diol or of an aliphatic diamine or the group —NH—CO—NH— and n represents 1, 2 or 3,

with formaldehyde and hydrogen in the presence of a condensation catalyst and a hydrogenation catalyst at elevated temperature, wherein the methylene compound is introduced into a liquid phase of the mixture of reactants over the course of the reaction.

4,567,005

ALLYLATION OF CARBON ACIDS

Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1983, Ser. No. 487,481
Int. Cl.[4] C07C *121/70, 49/203*
U.S. Cl. 260—465 D 12 Claims

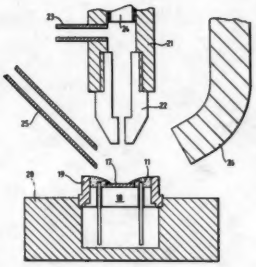
1. A process for allylating a carbon acid containing an ionizable carbon-hydrogen bond such that the pK of the carbon acid is equal to or less than 25 which process comprises reacting the carbon acid with an allyl carbonate in the presence of a molybdenum, tungsten, cobalt, nickel, ruthenium, rhodium, osmium, iridium, or platinum catalyst, under conditions such that the carbon acid is allylated.

4,567,006

METHOD FOR ENCAPSULATING MICROELECTRONIC SENSOR DEVICES

Arthur K. Covington, Newcastle upon Tyne, and Alastair Sibbald, Tyne and Wear, both of England, assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 366,722, Apr. 8, 1982, Pat. No. 4,502,938.
This application Jun. 4, 1984, Ser. No. 617,271
Claims priority, application United Kingdom, Apr. 9, 1981, 8111199
Int. Cl.[4] B29C *39/18*
U.S. Cl. 264—22 4 Claims



1. A method of encapsulating a microelectronic device comprising the steps of

affixing a collar around said device,

directing a jet of gas onto a predetermined area of said device that is to remain free from encapsulating material,

flowing said encapsulating material into said collar, said material flowing around said region upon which said jet impinges, and

curing said encapsulating material.

4,567,007

METHOD OF MAKING CARBON/CARBON COMPOSITES

Isaac E. Harder, Grand Prairie, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 29, 1980, Ser. No. 182,570
Int. Cl.[4] B32B *9/00, 31/20*
U.S. Cl. 264—29.5 21 Claims

1. The method of making a carbon/carbon composite structure, comprising the steps of:

(a) fabricating a pre-form body of the desired configuration from a graphite fabric impregnated with a carbonizable fluid comprising a phenolic resin;

(b) enclosing the pre-form body in a flexible bag;

(c) reducing the pressure within said flexible bag to a pressure less than atmospheric;

(d) enclosing said flexible bag in an enclosed containers

(e) forming a pressure within said enclosed container of about 45 psia;

(f) venting said flexible bag to atmosphere;

(g) heating said pre-form body to a first temperature at which said carbonizable fluid is liquid and begins to cure while maintaining said pressure within said enclosed container at about 45 psia; and

(h) thereafter reducing the pressure within said enclosed container to a pressure of at least about 30 psia and heating said pre-form body to a second temperature greater than the curing temperature of said carbonizable fluid.

4,567,008

PRODUCTION OF FOAMS

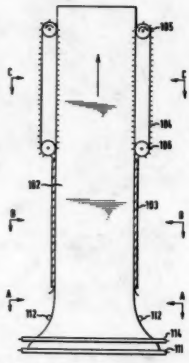
Anthony C. M. Griffiths, Brickhill, England, assignor to Hyman International Limited, Oldham, England

Continuation-in-part of Ser. No. 438,879, Oct. 5, 1982, Pat. No. 4,504,429. This application Aug. 25, 1983, Ser. No. 526,494

Claims priority, application United Kingdom, Feb. 18, 1981, 8105078; Jan. 2, 1983, 8301733

Int. Cl.[4] B29C *67/22, 39/44, 39/06*

U.S. Cl. 264—40.5 34 Claims



1. A method of continuous production of foamed material, wherein foam forming materials are fed from below at a controlled rate and the foamed material formed is drawn away from above at a corresponding rate; wherein foaming takes place in a diverging expansion enclosure bounded by moving sheet material constrained to follow a diverging path and drawn away from above so as to travel with the foaming material at a rate corresponding to its rate of travel; wherein the enclosure is defined above by foam already expanded, at the sides by said sheet material, and below by a feed zone sealed to contain the foam forming materials, the enclosure leading into an upwardly directed take off path for the foam; and wherein the expansion closure is formed by flexible sheet material in tubular form which is fed flat with foam forming materials passing to the interior of the tube and then drawn away at a rate method to the rate of feed, guided externally to assume a predetermined cross section as the foam forming materials expand within it, and constituting both said feed zone and said expansion enclosure.

4,567,009

PRODUCTION OF MICROFILTRATION MEMBRANE FILTER

Charles T. Badenhop, and Joachim Fischer, both of Bad Kreuznach, Fed. Rep. of Germany, assignors to Seitz Filter Werke Theo & Geo Seitz GmbH & Co., Bad Kreuznach, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,379

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220376

Int. Cl.[4] B29C *67/20*

U.S. Cl. 264—41 8 Claims

1. A method of making a microfiltration filter membrane which comprises the steps of:

(a) forming a solution of a copolymer of isophthalic acid and m-phenylenediamine in a solvent system containing at least two solvents selected from the group which consists of N-methylpyrrolidone, dimethylformamide and dimethylacetamide in which no one of said solvents is in an amount of more than 80% of the solvent system and the solvents of said system are in a proportion selected in accordance with a desired pore size of said membrane;

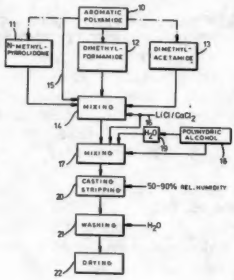
(b) forming a mixture which consists essentially of:

6 to 12 parts by weight of said copolymer in said solution formed in step (a),

2 to 6 parts by weight of an alkali chloride or alkaline earth chloride,

1 to 4 parts by weight of water, and

10 to 25 parts by weight of a polyvalent alcohol or water as a structure-loosening additive;



(c) casting the mixture of step (b) onto a smooth surface of a chemically inert material and gelling the cast mixture in an atmosphere having a relative humidity of 50 to 90% to form a membrane of a thickness of 0.05 to 0.15 mm, a pore size of 0.05 micron to 10 microns, and microporous on both surfaces of the membrane;

(d) washing said membrane upon the termination of gelling with a substance in which said copolymer is substantially insoluble to remove solvent therefrom; and

(e) drying the washed membrane.

4,567,010

GRANULATION

Denis A. Hutton, Sale, and Malcolm H. Millar, Widnes, both of England, assignors to Interox Chemicals Limited, London, England

Filed Aug. 24, 1982, Ser. No. 410,988

Claims priority, application United Kingdom, Sep. 8, 1981, 8127157

Int. Cl.[4] C09C *1/56*

U.S. Cl. 264—117 17 Claims

1. A process for granulating particles of one or more magnesium salts of an organic peroxyacid carboxylate, comprising the steps of agitating the particles, thereby bringing them into contact with each other from time to time whilst simultaneously spraying onto the agitated particles an aqueous solution of an hydroxylated organic polymer selected from the group consisting of polyvinylalcohol and carboxylated derivatives thereof to provide at least 0.1% of polymer based on the dry product, and drying the product, maintaining the temperature of the particles throughout the process at not more than 65° C.

4,567,011

MANUFACTURE OF HELICAL NETS

George S. Nalle, Jr., 401 Inwood Rd., Austin, Tex. 78746

Filed Apr. 19, 1984, Ser. No. 602,126

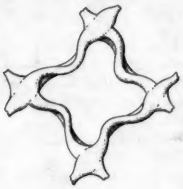
Int. Cl.[4] B29D *28/00*

U.S. Cl. 264—504 8 Claims

1. A process for making a plastic net with a partial to a multiplicity of spirals between the interstices or crossings of the net filaments comprising the steps of

extruding a multi-component sheet by the co-extrusion of at least two different plastic materials characterized by having different properties traction and orientation,

forming holes in the multi-component sheet at regular intervals to thereby define the filaments of the net, and



then orienting the multi-component sheet by stretching and releasing so that the individual filaments defined by the holes spiral.

4,567,012

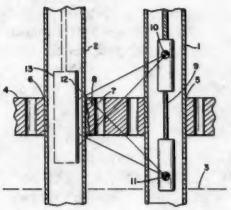
DUAL ISOTOPE METHOD TO RADIOGRAPH STRUCTURES IN NUCLEAR STEAM SUPPLY SYSTEMS

Frank T. Radcliff, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 12, 1982, Ser. No. 397,296

Int. Cl.⁴ G21C *17/00*

U.S. Cl. 376—245 **5 Claims**



4. In a steam generator having a vessel housing a plurality of open-ended tubes arranged laterally adjacent to one another and supported near their ends by a substantially continuous tube sheet extending across the vessel and supported by inter-tube structure periodically placed intermediate the tube ends, the method of interrogating a predetermined portion of the inter-tube structure for defects comprising the steps of:

a. inserting two radiation sources which are spaced from each other into a first tube to position each of the sources a predetermined vertical distance on each side of the plane of the inter-tube support structure portion,

b. and inserting a radiation responsive image recording means in a second tube adjacent the portion of the inter-tube support structure so that the support portion interrogated is between the two tubes to receive a uniform density of radiation from the two sources through the penetrated portion.

4,567,013

HYDROGEN MEASURING DEVICE

Robert Smith, Bethesda, Md., assignor to Scandpower, Inc., Bethesda, Md.

Filed Sep. 22, 1983, Ser. No. 534,717

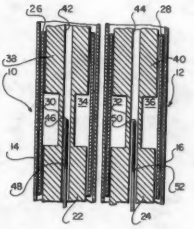
Int. Cl.⁴ G21C *17/00*

U.S. Cl. 376—247 **8 Claims**

1. A device for measuring free hydrogen concentration in the coolant of a nuclear reactor, the device comprising:

two gamma thermometers each comprising an elognated rod that is housed in a sheath, the rod is provided with a series of enclosed annular spaces formed between the rod and the sheath, a plurality of difference thermocouples are disposed along the rod and have hot and cold junctions, the hot junctions of the thermocouples are positioned adjacent the annular spaces and the cold junctions are positioned between the annular spaces;

whereby the annular spaces form annular heat insulating chambers for the hot junctions of the thermocouples, a vacuum is formed in the annular heat insulating chambers of the first of the two gamma thermometers for insulating the hot junctions and providing a space in which free hydrogen can collect, in the annular heat insulating chamber of the second of the two gamma thermometers a gas other than hydrogen is disposed therein to prevent hydrogen contamination of the annular space; and



the two gamma thermometers are positioned parallel and adjacent to one another so that the free hydrogen partial pressure can be calculated from the comparison of the indicated power generation rates of the two adjacent and parallel gamma thermometers.

4,567,014

CONTAINER FOR TRANSPORTING AND STORING NUCLEAR REACTOR FUEL ELEMENTS

Franz-Wolfgang Popp, Wedemark, and Kurt Feuring, Solms, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,065

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142646

Int. Cl.⁴ G21C *19/40*

U.S. Cl. 376—272 **11 Claims**

1. A container for transporting and storing irradiated nuclear reactor fuel elements, the container comprising:

a vessel made of nodular cast iron, the vessel having a base and a wall extending upwardly from said base, said wall having an upper end portion defining the opening of the vessel through which the fuel elements to be stored therein are passed;

an end ring mounted on said upper end portion, said end ring having a connecting extension cast-embedded into said upper end portion whereby said end ring is securely mounted to said vessel;

a sealing cover weldable to said end ring for sealing the container; and,

said end ring and said cover each being made of a material whereby said end ring upon being welded to said cover results in an effective gas-tight seal of said cover to said vessel without the necessity of subjecting said cover and said vessel to a follow-up heat treatment to remove unwanted microfissures from the weld.

4,567,015

FRAME FOR STORING NUCLEAR FUEL ELEMENTS

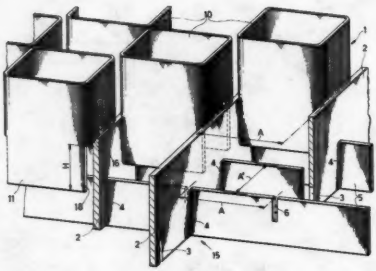
Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 7, 1983, Ser. No. 472,491

Claims priority, application Switzerland, Mar. 12, 1982, 1528/82

Int. Cl.[4] G21C *19/40*

U.S. Cl. 376—272 9 Claims



1. A frame for storing nuclear fuel elements, said frame comprising

a base having a plurality of intersecting interfitted metal strips, said strips being disposed in two mutually perpendicular groups; and

a plurality of square tubes secured to said base in upstanding manner; each said tube having a first pair of parallel walls parallel to one group of said metal strips with said strips of said one group disposed in planes coincident with the longitudinal axes of said tubes, each said tube having a second pair of parallel walls flush with a pair of strips of the other group of said metal strips.

4,567,016

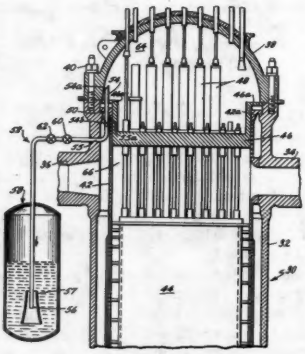
VENTING MEANS FOR NUCLEAR REACTORS

Long S. Tong, 9733 Lookout Pl., Gaithersburg, Md. 20879

Filed Jun. 24, 1983, Ser. No. 507,464

Int. Cl.[4] G21C *9/00*

U.S. Cl. 376—283 8 Claims



1. In a pressurized water reactor comprising a pressure vessel having a removable upper head attached to the top thereof with at least one pair of coolant inlet and outlet nozzles, the improvement comprising an internal venting conduit having one end disposed inside the space defined by said upper head, and the other end being connected to a high pressure container outside said reactor, the conduit passing through the wall of the pressure vessel or outlet nozzle of the reactor.

4,567,017

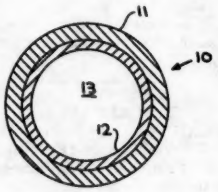
FUEL PIN CLADDING

Swaminathan Vaidyanathan, San Jose, and Martyn G. Adamson, Danville, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,146

Int. Cl.[4] G21C *3/00*

U.S. Cl. 376—417 16 Claims



1. In a fuel pin containing high density fuel for a breeder reactor, the improvement comprising: means for preventing liquid metal embrittlement of austenitic stainless steel fuel pin cladding induced by the presence of a mixture of cesium and tellurium fission products, said means consisting of at least one layer of barrier material positioned adjacent an inner surface of said cladding and selected from the group consisting of nickel and ferritic material.

4,567,018

CORE CONSTRUCTION OF NUCLEAR REACTOR

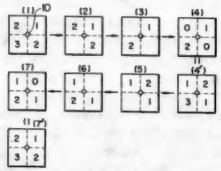
Masaki Enomoto, Mito, and Michihiro Ozawa, Hitachi, both of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 374,726, May 4, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,149

Claims priority, application Japan, May 6, 1981, 56-66919

Int. Cl.[4] G21C *3/32*

U.S. Cl. 376—435 27 Claims



1. A core construction of a nuclear reactor in which a multiplicity of core units each having four fuel assemblies disposed in a square pattern adjacent to a control rod are arranged to form a reactor core, wherein said reactor core comprises a central portion thereof in which the core units other than the core unit located at the center of the reactor core each include fuel assemblies of third-burning cyclic periods and fuel assemblies having other burning cyclic periods, said other burning cyclic periods including first-burning cyclic periods and second-burning cyclic periods, said first-, second-, and third-burning cyclic period fuel assemblies having experienced comparative degrees of burn-up proportional to their respective antecedent numbers, said core units other than said core unit located at the center of said reactor core being formed of a first pair of two of said fuel assemblies having the same first one of said other burning cyclic periods arranged along one of two

diagonals of said square pattern on opposite sides of said control rod, and a second pair of two fuel assemblies including one of said fuel assemblies of third-burning cyclic periods arranged along the other of said two diagonals on the opposite side of said control rod from a fourth fuel assembly having a second one of said other burning cyclic periods, said second one of said other burning cyclic periods being different from said first one of said other burning cyclic periods.

4,567,019
COLOR REVERSING COMPOSITIONS

William R. Lawton, Orchard Park, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Filed May 11, 1977, Ser. No. 796,012
Int. Cl.[4] G01N *31/22*; C09K *3/00*
U.S. Cl. 422—57 **8 Claims**

1. A heat-sensitive color-reversing composition comprising

(a) a 3,3-bis(p-aminophenyl)phthalide selected from the group consisting of
3,3-bis(p-aminophenyl)phthalide,
3,3-bis(p-dimethylaminophenyl)-5-dimethylamino phthalide,
3,3-bis(p-dimethylaminophenyl)-5-amino phthalide,
3,3-bis(p-dimethylaminophenyl)-6-dimethylamino phthalide,
3,3-bis(p-dimethylaminophenyl)phthalide,
3,3-bis(p-diethylaminophenyl)phthalide,
3,3-bis(p-di-n-propylaminophenyl)phthalide,
3,3-bis(4-dimethylamino-3-methylphenyl)phthalide,
3,3-bis(p-dimethylaminophenyl)-4,5,6,7-tetrachloro phthalide,
3,3-bis(p-diethylaminophenyl)-6-diethylamino phthalide,
3,3-bis(p-ethylaminophenyl)phthalide,
3,3-bis(p-methylaminophenyl)phthalide,
3,3-bis(p-benzylaminophenyl)phthalide, and
3,3-bis(p-chloromethylaminophenyl)phthalide;

(b) an organic acid selected from the group consisting of
thiosalicylic acid,
3-nitrosalicylic acid,
5-nitrosalicylic acid,
5-bromosalicylic acid,
3,5-dichlorosalicylic acid,
2,3-dihydroxybenzoic acid,
3,5-dibromosalicylic acid,
5-methylsalicylic acid,
5-methoxysalicylic acid, benzilic acid,
2,6-dihydroxybenzoic acid,
2-hydroxy-5-methoxybenzoic acid,
5-chlorosalicylic acid,
3,5-dinitrosalicylic acid,
1-hydroxy-2-naphthoic acid,
diglycolic acid, and
dithiodiglycolic acid;

said color-reversing composition being characterized in that it develops a color contrasting visibly with its original color upon heating, and returns to its original color upon cooling.

4,567,020
APPARATUS FOR LIQUID-LIQUID EXTRACTION USING A MIXING/SETTLING PROCESS

Louis Cognet, Le Vesinet; Christian Argoud, Vaulx en Velin; Francois Matray, Heyrieux, and Joël Mallevialle, Carrieres sur Seine, all of France, assignors to Societe Lyonnaise des Eaux et de l'Enclairage, Paris, France

Filed Apr. 27, 1984, Ser. No. 604,499
Claims priority, application France, May 2, 1983, 83 07253
Int. Cl.[4] B01L *11/00*
U.S. Cl. 422—101 **9 Claims**

1. An apparatus for carrying out a liquid-liquid extraction process by co-current contact between a first extraction liquid and a second liquid from which impurities are to be extracted by said first liquid, said first liquid being heavier than said second liquid, said apparatus comprising:

a mixing compartment in the form of a vertical column having an open lower end;

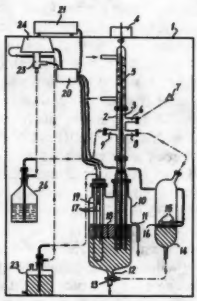
means for continuously introducing first and second liquids into said column such that said liquids pass co-currently downwardly through said column and are discharged from said open lower end thereof;

means for mixing said first and second liquids within said column to increase the contact therebetween so that impurities in said second liquid are extracted by said first liquid, said mixing means comprising a rotary element positioned within said column and extending throughout substantially the entire vertical length thereof, said rotary element having mixing surfaces extending perpendicularly or obliquely to the axis of said rotary element, and means for rotating said rotary element within said column;

a settling compartment in the form of a closed leak-proof container for receiving said liquids from said column and for allowing said liquids to separate by settling, with said heavier first liquid and extracted impurities settling to the bottom of said container and said second liquid collecting above said first liquid, said column extending into said container with said open lower end of said column being adjacent said bottom of said container;

first discharging means for discharging said collected second liquid from said container;

second discharging means for discharging said settled first liquid and extracted impurities from said bottom of said container;



means for receiving said first liquid and extracted impurities from said second discharging means, for separating said first liquid from said impurities, and for recirculating said first liquid back to said column, said means for continuously introducing said first liquid into said column, comprising said means for recirculating said first liquid;

means for removing samples of said first liquid and extracted impurities from said second discharging means for analysis;

a first storage tank containing make-up first liquid and connected to said container;

means for detecting the level of said first liquid in said container, said level decreasing as a function of losses of said first liquid during said process, and for generating a signal representative of a predetermined loss of said first liquid;

a second storage tank containing reagents employable to facilitate said extraction process and connected to said column;

a source of compressed air connected to said first and second storage tanks; and

electronic control means, connected to said compressed air source and to said detecting means, for operating said source to supply compressed air to said first storage tank to discharge therefrom make-up first liquid to said container in response to said signal from said detecting means, and for operating said source to supply compressed air to

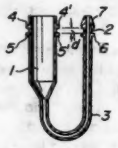
said second storage tank to discharge therefrom reagents to said column.

4,567,021

U-SHAPED REACTION TUBE MADE OF ELASTIC MATERIAL

Toshio Sakagami, Chofu, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,877
Claims priority, application Japan, Oct. 19, 1981, 56-165628
Int. Cl.[4] B01L *3/00*
U.S. Cl. 422—102 **6 Claims**



1. A U-shaped reaction tube for use in an automatic chemical analyzer, comprising:

a cup portion made of elastic material, having a first end and a second end, and an area between said first end and said second end having a predetermined first radius;

a U-shaped tube portion made of elastic material, said tube portion having a predetermined second radius less than said predetermined first radius of the cup portion, a first end of the U-shaped tube portion being coupled with said second end of said cup portion and a second end extending to a plane near said first end of said cup portion; and

a non-cupped end portion made of elastic materials and coupled with said second end of said U-shaped tube portion, whereby said cup portion, said U-shaped tube portion and said non-cupped end portion are a unitary body such that the cup portion can be twisted about its longitudinal axis and can be shifted laterally with respect to the non-cupped end portion;

wherein the elastic materials are of an analytical quality so that they will not react substantially with substances to be tested in the reaction tube, and the reaction tube is sized for use in large quantity in an automatic chemical analyzer.

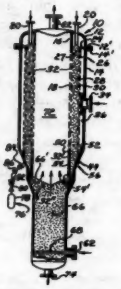
4,567,022

APPARATUS FOR FACILITATING SAMPLING OF PARTICULATE MATTER PASSING FROM ONE TREATMENT ZONE TO ANOTHER

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 24, 1984, Ser. No. 686,053
Int. Cl.[4] B01J *38/42*
U.S. Cl. 422—144 **10 Claims**

1. An apparatus for transferring or distributing particles of downwardly moving contact material from an upper annular zone, in which they are adapted to be contacted by a first gas flowing radially inwardly through them, to a lower zone in which they are adapted to be contacted by a second gas, characterized in that said upper annular zone is defined by axially elongated portions of a pair of coaxial, radially spaced screen elements, said elongated portions being formed so as to contain a plurality of gas flow openings of less width than the dimensions of the contact material in said annular zone, said lower zone being of generally cylindrical shape and having a vertically elongated, imperforate, external wall portion which radially confines the contact material within said lower zone, said external wall portion being joined to the radially outer one of said pair of screen elements by the outer wall of a generally annular transition element, said generally annular transition element including an outer wall portion joined to the external wall portion of said lower zone and to the outer screen element and a generally cylindrical, imperforate inner wall portion which is joined to the radially inner one of said pair of screen elements, the bottom end of said inner wall portion defining the upper height limit which contact material can reach within the lower zone after having passed downwardly through said annular transition element and into said lower, generally cylindrical zone, said lower, generally cylindrical zone being coaxial with, and in direct and open communication with, a generally cylindrical vapor collection zone positioned above it which has its side wall defined at its lower portion by said inner wall portion of said annular transition element, means for introducing a first gas at a selected pressure into an upper portion of said apparatus at at least one location adjacent said upper annular zone, means for introducing a second gas at a selected pressure into a lower portion of said apparatus so that



it may flow upwardly through said lower, generally cylindrical zone, said first and second gases each being adapted to flow first through a bed of contact particles in its respective zone and then into said vapor collection zone, said vapor collection zone being maintained at a pressure less than the selected pressure of either of said first and second gases whereby said second gas will pass directly out of the top of said lower, generally cylindrical zone and into said vapor collection zone, the inner wall portion of said generally annular transition element cooperating with an unperforated lower end portion of said radially inner screen element to which it is joined so as to define the vertical height of a transition zone between the upper and lower zones, said transition zone having a vertical height which is no less than the radial distance between the screen elements and which is sufficient to contain enough particles of contact material to generate a back pressure which will prevent said second gas from entering said transition zone.

4,567,023

MULTIPLE-STAGE REACTOR SYSTEM FOR A MOVING CATALYST BED

Arthur R. Greenwood, Niles; Jeffrey E. Burgard, Lombard, and Roger L. Throndson, Elk Grove Village, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 27, 1984, Ser. No. 584,207
Int. Cl.[4] B01J *8/12*; C10G *35/10*
U.S. Cl. 422—192 **9 Claims**

1. A multiple-stage reactor system for effecting radial flow contact of a reactant stream with catalyst particles movable as an annular-form bed through said system by gravity flow, which comprises in combination:

(A) a vertically elongated confined chamber having vertical walls;

(B) at least two vertically spaced apart reactor sections in said chamber;

(C) at least the upper one of said reactor sections comprising:

(i) an enclosed inner tubular-form catalyst retaining screen

coaxially disposed within an outer vertically positioned tubular-form catalyst retaining screen to form an annular-form catalyst retaining section, a bottom enclosing said annular-form catalyst retaining section, said catalyst retaining section having an inlet manifold space around the exterior thereof as defined by the chamber walls and said outer catayist retaining screen, and an outlet manifold space within the inner space defined by said inner catalyst retaining screen;

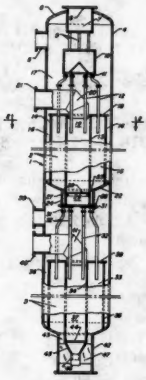
(ii) an upper annular shaped partition means covering the top of sais annular-form catalyst retaining section;

(iii) a second transvers partition means below said catalyst retaining section and forming said bottom of said catalyst retaining section, said second transverse partition means being connected to said chamber walls and having an opening through which said inner catalyst retaining screen extends to form an annular-form catalyst passageway between said second transverse partition and said inner catalyst retaining screen;

(iv) a catalyst transfer means comprising:

(a) a tubular-form well extending below said opening in said second transverse partition means;

(b) a bottom transverse partition means supporting said inner catalyst retaining screen in said well to form an annular-form catalyst collecting zone bounded by said



well and said bottom transverse partition means, said catalyst collecting zone being below said annular-form catalyst retaining section and in communication with said annular-form catalyst passageway;

(c) a plurality of catalyst outlet means uniformly circumferentially spaced in the bottom of said annular-form catalyst collecting zone; and

(d) an elongated catalyst transfer conduit connected to each of with said outlet means and with a next lower catalyst retaining section whereby catalyst particles can move by gravity flow from said upper reactor section to a next lower reactor section;

(v) a reactant stream inlet means located in an upper portion of each of said at least one reactor sections, said inlet means being in open communication with said inlet manifold space around the exterior of said catalyst retaining sections therein; and

(vi) a reactant stream outlet means from each of said at least one reactor sections which is connected with the upper end of the inner catalyst retaining screen and in open communication with said outlet manifold space defined by said inner catalyst retaining screen;

(D) a catalyst inlet means connected with the upper portion of said chamber; and

(E) catalyst withdrawal means connected with the lower portion of said chamber.

4,567,024

ANALYTICAL ELEMENT

Mikio Koyama, and Kenichiro Okaniwa, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,837
Claims priority, application Japan, Jan. 14, 1982, 57-5192
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 422—56 **12 Claims**

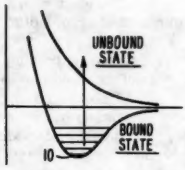
1. An analytical element comprising a light-transmissive and liquid-impervious support having thereon, in order from the support side, at least one reagent layer containing at least one kind of reagent reactive with a component in a fluid sample, a shielding layer and at least one porous spreading layer, said shielding layer comprising at least a white pigment and substantially water-dispersible reactive polymer which comprises a copolymer having (i) monomeric units which have a reactive group and (ii) at least one kind of hydrophobic monomer which is not said monomeric units (i).

4,567,025

CHEMICAL SEPARATION METHOD FOR URANIUM ISOTOPES

Steven H. Peterson, Murrysville, and D. Colin Phillips, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 28, 1983, Ser. No. 525,590
Int. Cl.[4] B01D *59/00*
U.S. Cl. 204—157.2 **5 Claims**



1. A process for isotopic enrichment of uranium comprising the steps of:

(a) preparing a solution of a uranium compound and solvent characterized in that said uranium compound involves a mixture of uranium isotopes wherein said isotopic mixture is to be enriched and said uranium compound is further characterized in that it possesses at least one excited state in solution wherein the respective isotopes in said excited state preferentially react at different rates by virtue of dissimilar nuclear magnetic moment contributions to the chemical kinetics of the excited state reactions and said chemical reactions of said excited state lead to the isolation of a phase that possesses a uranium isotopic distribution characteristic of enrichment, said uranium compound being the uranyl ion in the presence of at least one complexing ligand, said ligand being selected from the group consisting of CO_3^{2-}, O_2^{2-}, F_-, CH_3COO^-, $C_2O_4^{2-}$, and H_2O;

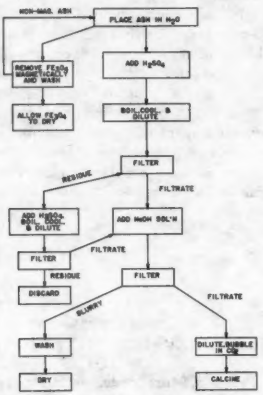
(b) exciting said uranium compound in solution thus promoting said chemical reaction that preferentially forms said isolated phase containing said enriched uranium isotopic distribution said excitation involving photolysis of the complexed uranyl ion; and

(c) separating said enriched phase thus recovering enriched uranium.

4,567,026
METHOD FOR EXTRACTION OF IRON ALUMINUM AND TITANIUM FROM COAL ASH

Bohdan Lisowyj, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Filed Oct. 24, 1984, Ser. No. 664,359
Int. Cl.[4] C01G *23/04, 49/02;* C01F *7/02*
U.S. Cl. 423—81 2 Claims



1. A method for the recovery of iron, aluminum, and titanium from coal ash which comprises:

(a) magnetically extracting magnetite from the ash,

(b) leaching the ash with a solution of a mineral acid selected from the group consisting of sulfuric, hydrochloric, and nitric acids,

(c) precipitating and removing titanium and iron hydroxides from the leach solution by adding thereto a solution of a strong base selected from the group consisting of sodium, potassium, and ammonium hydroxides,

(d) precipitating aluminum hydroxide by contacting the remaining solution from step (c) with a precipitation agent selected from the group consisting of carbon dioxide, a weak mineral acid, and aluminum hydroxide seed, and

(e) removing the aluminum hydroxide.

4,567,027
PROCESS FOR DEFLUORINATING AN ACID SULPHATE SOLUTION

Jacquy J. C. Detournay, Overpelt, and Jozef V. M. Sterckx, Neerpelt, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

Filed Jul. 16, 1984, Ser. No. 631,168
Claims priority, application Luxembourg, Jul. 19, 1983, 84923
Int. Cl.[4] C01G *9/06*
U.S. Cl. 423—101 11 Claims

1. A process for separating F^- ions from an acid aqueous solution of $ZnSO_4$, comprising the steps of

(a) adding Al^{3+} and PO_4^{3-} ions to the solution so that the solution contains at least about 1 g/l of Al^{3+} and at least about 3.5 g/l of PO_4^{3-};

(b) neutralizing the solution up to a pH higher than 4 and lower than that which causes a substantial precipitation of the Zn content of the solution in the form of at least one compound chosen from the group of hydroxides and basic salts, thereby producing a fluorinated precipitate, wherein the neutralization is carried out up to a pH lower than about 5 and a temperature of between about 45° and 90° C. thereby producing a fluorinated precipitate; and

(c) seperating said fluorinated precipitate from the solution, thereby producing a partially defluorinated solution.

4,567,028
PROCESS FOR THE PREPARATION OF PHOSPHONITRILE CHLORIDE OLIGOMER

Hiroshi Tanino, Hasuda; Tetsuhiko Okamoto, and Shinichiro Ueyama, both of Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,663
Claims priority, application Japan, Feb. 24, 1984, 59-32525
Int. Cl.[4] C01B *25/10*
U.S. Cl. 423—300 12 Claims

1. A process for the preparation of phosphonitrile chloride oligomer which comprises reacting phosphorus pentachloride with ammonium chloride in the presence of a polyvalent metal compound catalyst in an inert organic solvent, characterized by the presence in the reaction system of a catalytic amount of a basic organic compound selected from the group consisting of pyridine and alkyl-substituted pyridine derivatives which can react with phosphorus pentachloride to form chloropyridinium salts.

4,567,029
CRYSTALLINE METAL ALUMINOPHOSPHATES

Stephen T. Wilson, Shrub Oak, and Edith M. Flanigen, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 15, 1983, Ser. No. 514,334
Int. Cl.[4] C01B *25/26, 25/36;* B01J *27/18, 29/00*
U.S. Cl. 423—306 55 Claims

1. Crystalline metal aluminophosphates having a three-dimensional microporous framework structure of MO_2^{-2}, AlO_2^- and PO_2^+ tetrahedral units and having an empirical chemical composition on an anhydrous basis expressed by the formula

$$mR: (M_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the moles of "R" present per mole of $(M_xAl_yP_z)O_2$ and has a value of from zero to 0.3, "M" represents at least one metal of the group magnesium, manganese, zinc and cobalt, "x", "y" and "z" represent the mole fraction of the metal "M", aluminum and phosphorus respectively present as tetrahedral oxides, said mole fractions being such that they are within the tetragonal compositional area defined by points A, B, C and D of the ternary diagram which is FIG. 1 of the drawings.

48. Process for preparing a crystalline metal aluminophosphate of claim 1 which comprises forming a reaction mixture composition expressed in terms of molar oxide ratios as follows:

$$aR: (M_xAl_yP_z)O_2:bH_2O$$

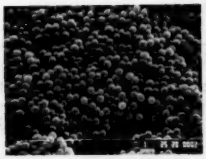
wherein "R" is an organic templating agent; "a" has a value great enough to constitute an effective concentration of "R" and is within the range of greater than zero to 3; "b" has a value of from zero to 500; "M" represents a metal of the group zinc, magnesium, manganese and cobalt, "x", "y" and "z" represent the mole fractions, respectively, of "M", aluminum and phosphorus in the $(M_xAl_yP_z)O_2$ constituent, and each has a value of at least 0.01, and being within the hexagonal compositional area defined by points E, F, G, H. I, and J which is FIG. 3 of the drawings, and crystallizing the reaction mixture thus formed at a temperature of from 100° C. to 225° C. until crystals of the metal aluminophosphate are formed.

4,567,030

AMORPHOUS, SPHERICAL INORGANIC COMPOUND AND PROCESS FOR PREPARATION THEREOF

Shigeki Yuasa; Minahiro Okabayashi, both of Fujisawa; Hideki Ohno; Katsumi Suzuki, both of Sagamihara, and Koshi Kusumoto, Yokohama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Dec. 23, 1982, Ser. No. 452,735
Claims priority, application Japan, Dec. 23, 1981, 56-206862
Int. Cl.[4] C01B *33/20*
U.S. Cl. 423—326 14 Claims



x 20,000

1. Spherical particles comprising an amorphous composition composed of (1) silica and (2) 0.01 to 20 mole %, based on silica, of an oxide of a metal of Group IV of the periodic table and having a particle size of 0.1 to 1.0 μm, said components (1) and (2) being present in the chemically bonded state and being inseparable from each other, said particles having a refractive index of from 1.35 to 1.70 and a narrow particle size distribution having a standard deviation value smaller than 1.30.

5. A process for producing an amorphous inorganic oxide composition, which comprises partially hydrolyzing a hydrolyzable organic silicon compound in an organic solvent, mixing the partially hydrolyzed product and a hydrolyzable organic compound of a metal (M) of Group IV of the periodic table in an organic solvent so that the proportion of MO_2 is 0.01 to 20 mole % based on SiO_2, adding the mixed solution to a hydrous alkaline solvent capable of dissolving the organic silicon compound and the organic compound of the Group IV metal but substantially incapable of dissolving the reaction product, reacting the partially hydrolyzed product of the organic silicon compound and the organic compound of the Group IV metal at a temperature of 0° to 40° C. under hydrolysis and precipitating spherical particles of an amorphous composition of silica and an oxide of a metal of Group IV.

6. A process for producing an amorphous inorganic oxide composition which comprises partially hydrolyzing a hydrolyzable organic silicon compound in an organic solvent, mixing the partially hydrolyzed product and a hydrolyzable organic compound of a metal (M) of Group IV of the periodic table in an organic solvent so that the proportion of MO_2 is 0.01 to 20 mole % based on SiO_2, adding the mixed solution to a hydrous alkaline solvent capable of dissolving the organic silicon compound and the organic compound of the Group IV metal but substantially incapable of dissolving the reaction product, reacting the partially hydrolyzed product of the organic silicon compound and the organic compound of the Group IV metal at a temperature of 0° to 40° C. under hydrolysis, thus precipitating spherical particles of an amorphous composition of silica and an oxide of a metal of Group IV, and thereafter adding a hydrolyzable organic silicon compound to the reaction system to perform hydrolysis and deposit silica on the surface of the spherical particles.

4,567,031

PROCESS FOR PREPARING MIXED METAL OXIDES

Brian Riley, Willimantic, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 27, 1983, Ser. No. 565,964
Int. Cl.[4] C01D *15/00*; C01G *51/00, 53/00*
U.S. Cl. 423—593 18 Claims

1. A process for preparing a mixed metal oxide having the formula $Li_xM_yO_z$ where M is cobalt or cobalt and nickel, x is a number from about 0.1 to about 1.1, y is a total number from about 1.1 to about 0.1, respectively, and z is a number from about 1.9 to about 2.1 which comprises

preparing a mixed solution containing x moles of a soluble oxygen-containing salt of lithium and y total moles of soluble oxygen-containing salt(s) of M in a solvent therefor, the soluble oxygen-containing salts being nitrates, oxalates or acetates;

concentrating the mixed solution;

co-crystallizing a mixed salt of lithium and of M from the concentrated mixed solution; and

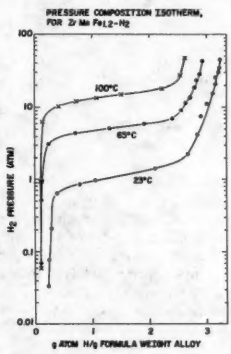
calcining the co-crystallized mixed salt at a low temperature of from about 400° C. to about 500° C. for a short period of time of from about 1 hour to about 4 hours to form the mixed metal oxide.

4,567,032

ZIRCONIUM-MANGANESE-IRON ALLOYS

William E. Wallace, Pittsburgh, Pa., and Gui Y. Yu, Naujing, China, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 5, 1985, Ser. No. 741,580
Int. Cl.[4] C01B *6/00*; C22C *30/00*
U.S. Cl. 423—644 6 Claims



1. A ternary alloy of the formula:

$ZrMnFe_x$

wherein x has a value from 1.2 to 1.3, and their hydrides.

4,567,033

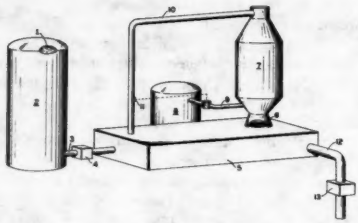
LOW-ENERGY METHOD FOR FREEING CHEMICALLY BOUND HYDROGEN

Arthur S. Kesten, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1984, Ser. No. 664,825
Int. Cl.[4] C01B *13/00*
U.S. Cl. 423—648 R 9 Claims

1. A method for reducing the energy required for a dehydrogenation reaction by shifting the equilibrium of the hydrogenation-dehydrogenation equilibrium reaction system comprising: (a) removing at least a portion of the generated equilibrium reaction hydrogen through a membrane;

(b) reacting the removed hydrogen with oxygen to produce water and heat; and



(c) adding substantially all the produced water and heat into the equilibrium reaction system.

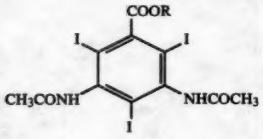
4,567,034

ESTERS OF DIATRIZOIC ACID AS X-RAY CONTRAST AGENTS

Isabel Charles, Wirral, and Malcolm Robinson, South Wirral, both of United Kingdom, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 7, 1984, Ser. No. 648,393
Int. Cl.[4] A61K *49/04;* **C07C** *101/68*
U.S. Cl. 424—5 **14 Claims**

1. An X-ray contrast agent having the structure



wherein R is an alkyl group of from 10 to 22 carbons.

4. An X-ray contrast medium comprising an X-ray contrast agent as defined in claim 1 and a carrier therefor.

7. A method for the X-ray visualization of body cavities and organs, which comprises administering to the body of the test object an effective contrast producing amount of an X-ray contrast medium as defined in claim 4.

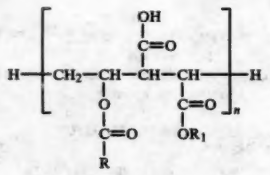
4,567,035

LOW MOLECULAR WEIGHT HAIR SPRAY

Burton H. Waxman, Rockaway, and I. Sioun Lin, Oak Ridge, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Aug. 22, 1983, Ser. No. 525,357
Int. Cl.[4] A61K *7/11, 31/74*
U.S. Cl. 424—47 **9 Claims**

1. In a hair spray formulation containing a hair spray resin, the improvement which comprises using essentially the polymer having the formula



as the hair spray resin wherein R and R_1 are each independently alkyl having from 1 to 6 carbon atoms and n has a value of between about 40 and about 250, which resin has a relative viscosity of between about 1.12 and about 2.03 and is derived from a preformed vinyl ester-maleic anhydride alternating copolymer.

4,567,036

CHEMOTHERAPEUTIC METHOD FOR TREATING PERIODONTAL DISEASE, AND COMPOSITION THEREFORE

Gilbert I. Simon, 111 Midland Ave., Bronxville, N.Y. 10708, and Roy T. Witkin, 23 Broadview Rd., Westport, Conn. 06880

Division of Ser. No. 565,661, Dec. 30, 1983, Pat. No. 4,521,403, which is a continuation-in-part of Ser. No. 459,525, Jan. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 145,590, May 1, 1980, abandoned. This application Mar. 6, 1985, Ser. No. 708,688
Int. Cl.[4] A61K *7/20, 31/79, 33/18, 31/755*
U.S. Cl. 424—51 **13 Claims**

1. A method of treating teeth in a human oral cavity to retard or reduce the formation of plaque thereon which comprises applying to the teeth and to plaque thereon an antimicrobial oral lavage in the form of an aqueous solution containing from about 0.5 to about 10.0% by weight of hydrogen peroxide and from 0.05 to about 2.0% by weight of iodine derived from a povidone-iodine complex in an amount and for a period of time sufficient to exert cidal action on microorganisms in or constituting said plaque and thereafter expelling the oral lavage from the oral cavity.

4,567,037

FATTY ACID DIESTERS

Joseph P. Ciaudelli, Ramsey, N.J., assignor to Revlon, Inc., New York, N.Y.

Filed Nov. 20, 1984, Ser. No. 673,301
Int. Cl.[4] A61K *7/027, 7/42;* **C07C** *69/593, 69/602*
U.S. Cl. 424—59 **10 Claims**

1. A fatty acid ester of the formula

$$CH_3(CH_2)_5CH(OCOR_1)(CH_2)_{10}COOR_2$$

wherein,

R_1 is a straight chain hydrocarbon radical having 17 carbon atoms with 1 to 3 double bonds therein; and

R_2 is a straight or branched chain hydrocarbon radical having 5 to 22 carbon atoms.

10. A cosmetic composition comprising by weight 1–20% of a fatty acid ester of the formula

$$CH_3(CH_2)_5CH(OCOR_1)(CH_2)_{10}COOR_2$$

wherein,

R_1 is a straight chain hydrocarbon radical having 17 carbon atoms with 1 to 3 double bonds therein; and

R_2 is a straight or branched chain hydrocarbon radical having 5 to 22 carbon atoms;

5–10% of an humectant;

0.2–1.0% of a thickener;

0.5–10% of an emulsifier; and

50–80% water.

4,567,038

SUNSCREEN COMPOSITION FOR HAIR PROTECTION

Joseph P. Ciaudelli, Ramsey, N.J., and Elizabeth Brand, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Mar. 6, 1985, Ser. No. 708,780
Int. Cl.[4] A61K *7/08, 7/09, 7/42*
U.S. Cl. 424—59 **6 Claims**

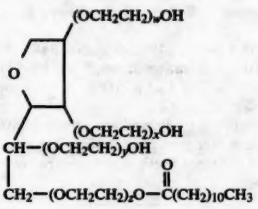
1. A sunscreen mousse composition comprising by weight: 0.001% to 15% of at least one sunscreen agent selected from the group consisting of ethoxylated p-amino benzoate, a diethanol amine salt of p-methoxycinnamic acid, 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid, disodium 2,2'-dihydroxy-4-4'-dimethoxy-5-5'-disulfoben-

zophenone, 2,4-dihydroxy-benzophenone, 2-hydroxy-4-methoxybenzophenone, 2,2',4,4'-tetrahydroxybenzophenone, 2,2'-dihydroxy-4,4'-dimethoxy-benzophenone, a dimethylamino propyl amine salt of p-dimethylamino-benzoic acid, a diethanolamine salt of p-dimethylamino benzoic acid, and trimethyl-2-hydroxy propyl-p-dimethylamino benzoate ammonium chloride;

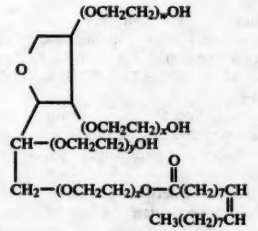
2.0 to 15.0% of an alcohol;

0.5% to 10.0% of a nonionic film-former;

0.1% to 2.0% of a nonionic surfactant selected from the group consisting of polythylene glycol ether of oleyl alcohol having the formula $CH_3(CH_2)_7CH{=}CH(CH_2)(OCH_2CH_2)_nOH$ wherein n has an average value of 20, polyethylene glycol ether of oleyl alcohol having the formula $CH_3(CH_2)_7CH{=}CH(CH_2)_7CH_2(OCH_2CH_2)_nOH$ wherein n has an average value of 10, polyethylene glycol ether of stearyl alcohol having the formula $CH_3(CH_2)_{16}CH_2(OCH_2)_nOH$ wherein n has an average value of 2, polyethylene glycol ether of stearyl alcohol having the formula $CH_3(CH_2)_{16}CH_2(OCH_2CH_2)_nOH$ wherein n has an average value of 20;



where w + x + y + z has an average value of 20; and



where w + x + y + z has an average value of 20;

0.01–0.5% of a protein conditioner

0.1% to 0.8% of the water soluble plasticizer dimethylsiloxane with polyoxyethylene and/or polyoxypropylene side chains;

0.1% to 5.0% of a cationic surfactant selected from the group consisting of minkamidopropyl dimethyl 2-hydroxy-ethyl ammonium chloride, decyl dimethyl octyl ammonium chloride and isododecylbenzyl triethanolammonium chloride; and

q.s. 100% water.

4,567,039

HAIR CONDITIONING COMPOSITION AND METHOD

Richard P. Stadnick, Blauvelt, N.Y., and Richard W. Schnetzinger, Hightstown, N.J., assignors to Revlon, Inc., New York, N.Y.

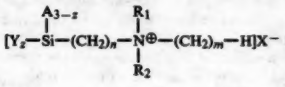
Filed Oct. 12, 1984, Ser. No. 660,158

Int. Cl.[4] A45D *7/00*; A61K *7/06, 7/13*

U.S. Cl. 132—70 **12 Claims**

1. A hair conditioning composition comprising:

(a) an effective amount to render long-lasting conditioning effect to hair of an organosilicon quaternary ammonium halide having the formula:



wherein

Y is a hydrolyzable radical selected from the group consisting of alkoxy, halogen or hydroxy;

X is a halogen, sulfate, phosphate or carbonate;

R_1 is an alkyl radical of 1 to 4 carbon atoms;

R_2 is an aliphatic radical of 1 to 4 carbon atoms or an aromatic radical of 6 to 8 carbon atoms;

A is an aliphatic radical of 1 to 4 carbons or an aromatic radical of 6 to 8 carbons;

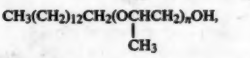
n is 1 to 6;

m is 1 to 18 and

z is 2 to 3;

(b) in an alkaline buffered aqueous/organic vehicle having a pH of about 8.0 to 10.0, said aqueous/organic vehicle comprises:

about 5 to 99% w/v of an organic solvent selected from the group consisting of methanol, ethanol, isopropanol, polyoxyethylene octyl phenyl ether having the formula $C_8H_{17}C_6H_4(OCH_2CH_2)_n{-}OH$, where n has an average value of 9, polyoxyethylene nonyl phenyl ether having the formula $C_9H_{19}C_6H_4(OCH_2CH_2)_n{-}OH$, where n has an average value of 12, polypropylene glycol myristyl ether having the formula



where n has an average value of 3, and acetylated polyoxyethylene lanolin alcohol with an average ethoxylation value of 9; and about 1 to 95% w/v of water.

4,567,040

STABILIZED HAIR SPRAY COMPOSITION AND PROCESS

Joseph J. Varco, Fairfield, and Carl E. Williams, Stratford, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 313,093, Oct. 19, 1981, abandoned. This application Jan. 30, 1985, Ser. No. 696,852

Int. Cl.[4] A61K *7/11, 7/135*

U.S. Cl. 424—70 **8 Claims**

1. A hair spray composition which comprises an alcoholic solution of partially neutralized vinyl/maleic copolymer and an amount of an alkali metal borohydride, or an amount of an oxidizer, either of the aforesaid amounts being effective to stabilize said composition against discoloration.

4,567,041

MUTANT STRAIN OF *LISTERIA MONOCYTOGENES* AND ITS USE IN PRODUCTION OF IGM ANTIBODIES AND AS AN IMMUNOTHERAPEUTIC AGENT

Vilas V. Likhite, 229 White St., Belmont, Mass. 02178

Continuation-in-part of Ser. No. 292,193, Aug. 12, 1981, abandoned, which is a division of Ser. No. 93,171, Nov. 13, 1979, Pat. No. 4,285,930, which is a continuation of Ser. No. 858,847, Dec. 8, 1977, abandoned. This application Aug. 2, 1983, Ser. No. 519,735

Int. Cl.[4] A61K *39/40, 39/395*; C07G *7/00*

U.S. Cl. 424—87 **10 Claims**

1. Method of manufacture of high titers of IgM antibodies specific to an antigen comprising a killed mutant strain of *Listeria monocytogenes akka* having the identifying characteristics of NRRL B-11,233, said antibodies when recovered being

characterized by their appreciable retention of the original immunological specificity shown in the biological system in which they were produced, which method comprises:

(a) injecting an antigen comprising said killed mutant strain of *Listeria monocytogenes akka* into a host animal, to load the animal;

(b) allowing sufficient time for the antibody response to form and build up, after which the animal is again injected with booster doses of said antigen from time-to-time;

(c) bleeding said host animal to recover the antibody containing serum; and

(d) recovering the high molecular weight IgM antibodies produced to the said antigen from the serum.

4,567,042

INACTIVATED CANINE CORONAVIRUS VACCINE

William M. Acree; Bobby Edwards, both of Temple, Tex., and John W. Black, Milton, Tenn., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 504,434, Jun. 15, 1983. This application Jun. 7, 1984, Ser. No. 618,638

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] A61K *39/12*

U.S. Cl. 424—89 **19 Claims**

1. A vaccine composition comprising inactivated canine coronavirus having a pre-inactivation titer of at least 10,000 canine coronavirus particles per milliliter and a veterinary pharmaceutically acceptable carrier therefor.

7. A vaccine composition which comprises an amount of inactivated canine coronavirus strain ATCC VR-2068 sufficient to be effective against canine coronavirus in combination with a carrier suitable for dogs.

8. A vaccine composition comprising inactivated canine coronavirus present in an amount of about 10,000 to 10,000,000 virus particles per dose as measured by the $FAID_{50}$ method, an adjuvant selected from the group consisting of ethylene maleic anhydride and a copolymer of styrene with a mixture of acrylic acid and methacrylic acid, and a non-toxic pharmaceutically acceptable carrier.

4,567,043

CANINE CORONA VIRUS VACCINE

William M. Acree; Bobby Edwards, both of Temple, Tex., and John W. Black, Milton, Tenn., assignors to American Home Products Corporation (Del.), New York, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,434

Int. Cl.[4] A61K *39/12*

U.S. Cl. 424—89 **23 Claims**

1. A vaccine composition comprising: a member selected from the class consisting of inactivated canine coronavirus and modified live canine coronavirus in an amount of at least 1000 virus particles per dose as measured by the $FAID_{50}$ method; and a non-toxic pharmaceutically acceptable carrier.

20. The method for protecting dogs from infection caused by canine coronavirus comprising: administering to a dog a vaccine composition containing a member selected from the class consisting of inactivated canine coronavirus ATCC No. VR 2068 and modified live canine coronavirus ATCC No. VR 2068, in an amount of at least 1,000 virus particles per dose as measured by the $FAID_{50}$ method.

4,567,044

LINIMENT COMPOSITION

Richard W. DeSantis, Monticello, N.Y., assignor to Victory Lane Ltd., Monticello, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,943

Int. Cl.[4] A61K *37/48*

U.S. Cl. 424—94 **8 Claims**

1. A liniment composition containing as active ingredients from 4–9 ounces of ammonium alum, 30–50 ounces of dimethyl sulfoxide, 10–20 ounces of goose oil, 5–15 ounces of mineral oil and 20–30 ounces of nitrofurazone (0.2% aqueous solution) and 4–10 grains of papain.

4,567,045

ISOTONIC GLYCEROL FREE INTRAVENOUS FAT EMULSION

Robert T. Lyons, Danville, Calif., assignor to Kabivitrum AB, Stockholm, Sweden

Filed Jan. 20, 1984, Ser. No. 572,714

Int. Cl.[4] A61K *35/78, 31/685, 37/22*

U.S. Cl. 424—195.1 **9 Claims**

1. A lipid emulsion suitable for parenteral administration, the emulsion being substantially free of glycerol and including L-alanine in an amount sufficient to provide a pharmaceutically acceptable osmolality, and wherein the amount of alanine ranges from about 1.0 to about 5.0 w/v %.

4,567,046

BREAD OR OTHER CEREAL-BASED FOOD IMPROVER COMPOSITION INVOLVING THE ADDITION OF PHOSPHOLIPASE A TO THE FLOUR

Seijiro Inoue, Machida, and Shigenori Ota, Komae, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1983, Ser. No. 548,514

Claims priority, application Japan, Nov. 10, 1982, 57-197098

Int. Cl.[4] A21D *8/04*

U.S. Cl. 426—20 **8 Claims**

1. A bread improver composition which contains effective amounts of wheat flour and phospholipase A substantially free from lipase and protease the mixture improving the quality of dough and bread.

4,567,047

CHEESE-CONTAINING CONFECTIONARY-LIKE COATING

SCM Corporation, 02, New York, N.Y.

Continuation-in-part of Ser. No. 402,844, Jul. 29, 1982, abandoned. This application Apr. 6, 1984, Ser. No. 597,557

Int. Cl.[4] A23G *3/00;* A23C *19/09;* A21D *15/08*

U.S. Cl. 426—94 **13 Claims**

1. A cheese flavored confectionery product capable of being applied to a substrate and having the appearance, flavor, and texture of a hard cheese, comprising, based on total composition weight;

(a) about 10–60% powdered dry cheese;

(b) about 10–35% particulate fill having a flavor which is bland or compatible in flavor with the flavor of cheese powder;

(c) about 20–60% hard butter having a Wiley Melting Point in the range of about 84° to 120° F., said hard butter having an SFI at 92° F. of at least about 13;

(d) an amount of a gloss-forming emulsifier effective to resist surface fracture and bloom;

(e) about 2–12% stearine based on hard butter weight;

said composition being processed by milling or refining and conching and having a MacMichael viscosity of at least about 30° at the temperature of application of the composition to a substrate.

4,567,048

INDIGOID DYES

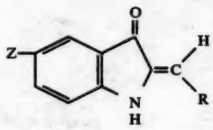
Gordon D. Gruetzmacher, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 453,635, Dec. 27, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 605,316

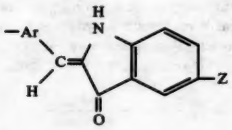
Int. Cl.[4] A23L *1/275;* C07D *209/36*

U.S. Cl. 426—250 **10 Claims**

1. A compound selected from the group consisting of water-soluble sulfonated indoxyl derivatives of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein Z is sulfonylhydroxy and R is a moiety of the formula:



wherein Z is as previously defined and Ar represents a divalent aromatic radical chosen from the group consisting of 1,4-phenylene, 1,3-phenylene, 2,5-dimethoxy-1,4-phenylene, 4,6-dimethoxy-1,3-phenylene, 4-dimethylamino-1,3-phenylene, 1,4-naphthylene and 2,6-naphthylene.

10. A method for coloring foods which comprises incorporating therein an effective amount of a dye or coloring compound as claimed in claim 1.

4,567,049

PROCESS AND APPARATUS FOR PRODUCING FILLED WAFER BLOCKS

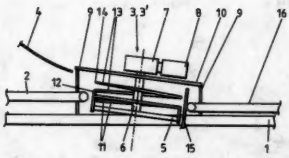
Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 17, 1984, Ser. No. 682,470

Claims priority, application Austria, Dec. 21, 1983, 4475/83

Int. Cl.[4] A21D *13/00*; A23G *3/00*

U.S. Cl. 426—275 **20 Claims**



1. A process of producing multi-layered filled wafer blocks consisting each of a plurality of superimposed sheets having an upper surface coated with a spreadable composition and a cover sheet at the top thereof, which comprises

(a) successively and one by one feeding the cover sheet and the coated sheets of each wafer block to a predetermined lower position in a stacking location,

(b) successively and one by one raising the sheets from the lower position to a predetermined upper position in the stacking location until the coated sheets are joined to the superimposed sheets to form each wafer block in the upper position, and

(c) discharging each formed wafer block in the upper position from the stacking location,

(d) the sheets being fed continuously to the lower position and each sheet being fed into the lower position before a preceding one of the sheets has reached the upper position.

4,567,050

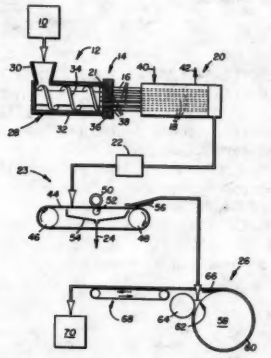
METHOD FOR PROCESSING MEAT PRODUCTS

Eldon N. Roth, 14565 Quaker Hill Rd., Nevada City, Calif. 95959

Continuation-in-part of Ser. No. 420,352, Sep. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 286,582, Jul. 24, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 601,912

Int. Cl.[4] A23L *1/317*

U.S. Cl. 426—417 **16 Claims**



1. In a method for processing a meat product material including muscle and connective tissue with minimum physical working thereof, said product characterized by the presence of individual pieces which cannot readily be caused to flow through restricted passages of processing equipment, the steps comprising

extruding the pieces of the meat product with extruding means and communicating said extruding means directly with outlet means comprising a plurality of die openings,

communicating the die openings directly with corresponding passages in a shell-and-tube type heat exchanger,

passing the extruded meat product pieces through the heat exchanger passages in a first-in, first-out manner,

facilitating passage of the pieces of meat product into the die openings by knife means arranged for cutting movement adjacent inlet ends of the die openings in order to prevent blockage of the die openings by the meat product pieces, whereby said extruding step and said knife means cooperate to permit the pieces of meat product to be forced into and through said die openings and passages in said shell-and-tube type heat exchanger,

operating the heat exchanger to change the temperature of the meat product to a selected level during passage of the meat product through said heat exchanger, and

receiving the meat product from the heat exchanger at said selected temperture level for further processing.

4,567,051

METHOD FOR PRODUCING SNACKS FROM DOUGH

John E. Baker, Farmers Branch, and David P. Fowler, Irving, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Nov. 4, 1982, Ser. No. 439,214

Int. Cl.[4] A21D *8/00*

U.S. Cl. 426—438 **15 Claims**

1. A method for forming snacks from sticky dough, comprising:

(a) forming sticky dough into a continuous elongated form, and

(b) thereafter continuously frying the dough in hot frying oil for a period of time sufficient to partially cook the dough, wherein, during the continuous partial frying of the dough, the continuous elongated form is first surrounded by and

transported by a stream of hot oil which partially fries the dough sufficiently to reduce the stickiness of the dough, then,

the continuous elongated form is cut into snack size pieces while being transported in the stream of hot oil and before the dough is fully cooked, then,

the snack size pieces are transported in the stream of hot oil to a further zone in the frying oil, then,

(c) the snack size pieces are submerged in the further zone of hot frying oil for a period of time sufficient to finish fry to form snacks.

4,567,052

3-PHENYL-4-CYANOPYRROLE DERIVATIVES, THE PREPARATION THEREOF, AND METHOD OF USE THEREOF AS MICROBICIDES

Robert Nyfeler, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

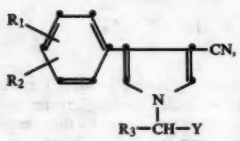
Filed Jun. 8, 1984, Ser. No. 618,867

Claims priority, application Sweden, Jun. 17, 1983, 833331; May 10, 1984, 842304

Int. Cl.[4] A23L *3/34*; C07D *207/30, 307/02, 407/00*

U.S. Cl. 426—532 10 Claims

1. A compound of the formula I



(I)

wherein

R_1 and R_2, each independently of the other, are hydrogen, halogen, methoxy or methylthio,

R_3 is hydrogen or C_1–C_8haloalkyl,

Y is hydroxy, halogen or the —O—C(O)—R_4 group, and

R_4 is hydrogen, C_1–C_8alkyl, C_1–C_8haloalkyl, C_2–C_6alkenyl, 2-tetrahydrofuryl, 2-tetrahydropyranyl, C_1–C_6alkoxycarbonyl or the —CH(R_5)—XR_6 group, wherein

X is oxygen or sulfur,

R_5 is hydrogen or C_1–C_3alkyl, and

R_6 is C_1–C_6alkyl, (C_1–C_6alkoxy)-C_1–C_6alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl, phenyl or phenyl which is substituted by halogen, C_1–C_6alkyl, C_1–C_6alkoxy, and/or C_1–C_6alkoxycarbonyl.

9. A method of controlling phytopathogenic microorganisms or of protecting cultivated plants from attack by said microorganisms comprising applying to said plants, to parts of plants or to the locus thereof a microbicidally effective amount of a compound of the formula I of claim 1.

10. A method of preserving or protecting storable goods by applying a microbicidally effective amount of a compound of the formula I of claim 1 to said storable goods.

4,567,053

METHOD OF INHIBITING SWEETNESS

Michael G. Lindley, Crowthorne, England, assignor to Tate & Lyle Public Limited Company, England

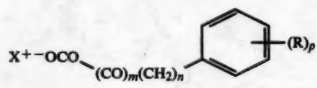
Filed Apr. 11, 1984, Ser. No. 599,260

Claims priority, application United Kingdom, Apr. 12, 1983, 8309855

Int. Cl.[4] A23L *1/22*; C07C *53/132*; A61K *9/20, 31/70*

U.S. Cl. 426—538 14 Claims

1. A method of reducing the sweetness of an ingestible product containing a sweetening sugar or sugar alcohol by incorporating therein a sweetness-reducing amount of at least one compound of the general formula:



(I)

in which m represents 0 or 1, and when m represents 0, n represents 1, 2 or 3, and p represents 1, 2, 3 or 4, and when m represents 1, n represents 1 or 2 and p represents 0, 1, 2, 3 or 4; the substitutents R individually represent a lower alkoxy group phenoxy group or a lower alkyl or trifluoromethyl group; two substituents R together represent an aliphatic chain linked to the phenyl ring at two positions, directly or via an oxa-group, or one substituent R represents a hydroxy group while at least one other substituent R represents an alkoxy group; and X^+ represents a physiologically acceptable cation.

4,567,054

SWEETENER COMPOSITION

Garyx Zimmerman, 2005 Pinehurst Rd., Los Angeles, Calif. 90068, and Donald E. Dickenson, 960 Larrabee St., Los Angeles, Calif. 90069

Filed May 6, 1985, Ser. No. 730,479

Int. Cl.[4] A23L *1/22*

U.S. Cl. 426—548 9 Claims

1. A method for preparing a sweetener composition containing from about 92 to about 98 wt. % glycerol, from about 0.5 to about 3.0 wt. % glycine, and from about 2.0 to about 5.0 wt. % gum arabic, which comprises:

(a) heating and stirring a first mixture containing at least about 16 parts by weight of glycerol per 1.0 part by weight of glycine at a temperature from about 100° to about 115° C. to obtain a solution of glycine in glycerol;

(b) heating and stirring a second mixture containing at least about 8.8 parts by weight of glycerol per 1.0 part by weight of gum arabic at a temperature from about 100° to about 115° C. to obtain a solution of gum arabic in glycerol; and

(c) blending the glycerol solution of glycine and the glycerol solution of gum arabic at a temperature from about ambient temperature to about 115° C. to produce said sweetener composition.

4,567,055

EXTRUDED CONFECTIONS

Carl O. Moore, Rochester, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Mar. 6, 1984, Ser. No. 587,339

Int. Cl.[4] A23G *3/00*; A23L *1/04, 1/195*

U.S. Cl. 426—578 11 Claims

1. A process for the manufacture of starch containing gel confections by extrusion comprising the steps of:

(a) mixing a nonbirefringent starch having a cold-water-solubility of greater than 25 percent, the starch being hydratable to function as a gelling colloid; and sweetener components including crystalline and liquid corn and sugar materials; and

(b) heating the mixture (a) and (b) at a temperature above the gelatinization point of the starch, but below the boiling point of the mixture to fully gelatinize the starch wherein said mixture has a moisture content between about 10 percent and about 25 percent; and

(c) extruding the mixture as a firm, transparent to translucent gel.

4,567,056

EDIBLE FAT AND A PROCESS FOR PRODUCING SUCH FAT

Werner J. Schmidt, Hamburg, Fed. Rep. of Germany, assignor to Lever Brothers Company, New York, N.Y.

Filed Jun. 19, 1984, Ser. No. 622,355
Claims priority, application Netherlands, Jun. 21, 1983, 8302198
Int. Cl.[4] A23D *5/02*
U.S. Cl. 426—607 8 Claims

1. A process for producing an edible fat, comprising:

(1) randomly interesterifying a starting mixture of oils comprising 30–60 wt. % of oil (a) selected from the group consisting of soybean-, sunflower-, safflower-, rapeseed-, cottonseed-, maize- and olive oil, wherein said oil (a) is free from crystallized fat at 10° C.; 5–40 wt. % of a partially hydrogenated oil (b) selected from the group consisting of soybean-, sunflower-, safflower-, rapeseed-, cottonseed-, maize- and olive oil, wherein said oil (b) has been subjected to hydrogenation under conditions resulting in from 30 to 70 wt. % fatty acids in the trans-configuration and a melting Point of from 30° to 45° C.; and 25–45 wt. % of a saturated oil (c) selected from the group consisting of soybean-. sunflower-, safflower-, rapeseed-, cottonseed-, maize- and olive oil, wherein said oil (c) has an iodine value of less than 10;

(2) fractionating the interesterified mixture to obtain a higher melting stearin fraction having substantially all the S_3-triglycerides in said mixture, and a lower melting olein fraction containing 0–6 wt. % of said S_3-triglycerides;

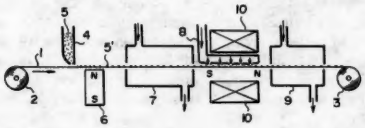
(3) mixing 50–100 wt. % of said olein fraction with 0–50 wt. % of an oil selected from the group consisting of palm oil and a mixture of palm oil and palm oil hydrogenated to a melting point of from 38° to 45° C. to obtain edible fat.

4,567,057

METHOD OF MAKING MAGNETIC RECORDING MEDIUM

Kenichi Masuyama; Toshimitu Okutu; Takahito Miyoshi; Hiroshi Ogawa; Masahiro Utumi; Masaaki Fujiyama, and Sugihiko Tada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 26, 1984, Ser. No. 654,549
Claims priority, application Japan, Oct. 3, 1983, 58-184827
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—48 2 Claims



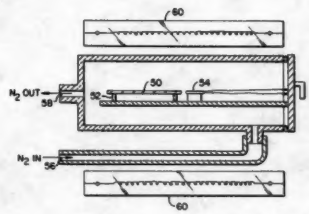
1. A method of making a magnetic recording medium by applying a magnetic coating composition, which comprises a binder dissolved in a solvent and magnetic grains dispersed therein, onto a surface of a non-magnetic substrate continuously moved, and by subjecting a coating film thus overlaid on the surface of said non-magnetic substrate to a magnetic orientation processing and a drying processing, wherein the improvement comprises the steps of: after said magnetic coating composition is applied onto the surface of said non-magnetic substrate, conducting preliminary orientation by use of a magnetic field generation means exhibiting a means magnetic flux density with the range of 300 gauss to 5,000 gauss, conducting preliminary drying to such an extent that the ratio of a solvent remaining in a coating film overlaid on said non-magnetic substrate is within the range of 50% to 95% of the ratio thereof in the original magnetic coating composition, conducting final orientation while intermediate drying is carried out to such an extent that the ratio of a solvent remaining in a coating film overlaid on said non-magnetic substrate is within the range of 5% to 70% of the ratio thereof in the original magnetic coating composition, and then conducting final drying to such an extent that the ratio of a solvent remaining in a coating film overlaid on said non-magnetic substrate is less than 5% of the ratio thereof in the original magnetic coating composition.

4,567,058

METHOD FOR CONTROLLING LATERAL DIFFUSION OF SILICON IN A SELF-ALIGNED $TISI_2$ PROCESS

Yun B. Koh, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Jul. 27, 1984, Ser. No. 634,937
Int. Cl.[4] B05D *3/06, 5/12;* B44C *1/22;* C03C *15/00*
U.S. Cl. 427—55 18 Claims



1. A method for forming a titanium silicide layer on the surface of a silicon layer comprising the steps of:

overcoating the surface of the silicon layer with titanium;

placing said overcoated silicon layer in an ambient atmosphere of ultrapure nitrogen; and

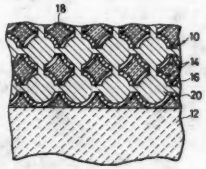
exposing said overcoated silicon layer to radiation from a tungsten-halogen source to heat said overcoated layer.

4,567,059

ELECTRONCONDUCTIVE PASTE TO BE BAKED ON CERAMIC BODIES TO PROVIDE CAPACITORS, VARISTORS OR THE LIKE

Nobutatsu Yamaoka, Harunamachi, and Kazuo Sasazawa, Maebashi, both of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 349,312, Feb. 16, 1982, abandoned. This application Jul. 5, 1983, Ser. No. 510,725
Claims priority, application Japan, Feb. 27, 1981, 56-27880
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—79 6 Claims



1. A method of forming a conductive electrode on a ceramic substrate to form a capacitor, varistor, thermistor, or piezoelectric element, comprising the steps of:

applying an electroconductive paste to said substrate, said paste comprising 100 parts by weight of zinc powder, from about 0.01 to 10.00 parts by weight of a glass frit, from about 0.01 to about 5.00 parts by weight of an additive selected from the class consisting of Pb, Bi, Pr, Cu, Cd and the compounds of these elements, and an organic

vehicle for pasting the mixture of the zinc powder, the glass frit and the additive; and

baking the paste on the ceramic substrate in order to drive off the organic vehicle and to cause the zinc powder particles to fuse to one another, whereby a conductor is formed.

4,567,060

METHOD OF PRODUCING A SEMICONDUCTOR LASER DEVICE

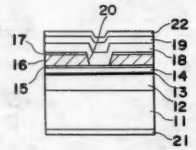
Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 671,951

Claims priority, application Japan, Nov. 18, 1983, 58-218276

Int. Cl.[4] H01L *7/00*

U.S. Cl. 427—87 **10 Claims**



1. A method of producing a semiconductor laser device, comprising

depositing a first cladding layer, an active layer, and a second cladding layer successively, which three layers having heterojunctions each between neighboring two layers, said first and second cladding layers being made of mixed crystals of a semiconductor material composing the active layer and another semiconductor material containing aluminum,

depositing a fourth thin semiconductor layer on the second cladding layer, said fourth layer being made of material not including aluminum, and having charge carriers of the same type with that of the second cladding layer,

depositing a fifth semiconductor layer on said fourth layer, said fifth semiconductor layer having charge carriers of the type opposite to that of the second cladding layer,

forming a stripe-like groove by etching in said fifth semiconductor layer down to said fourth semiconductor layer, and

depositing a sixth semiconductor layer on said fifth semiconductor layer and on said groove, said sixth layer having charge carriers of the same type with that of the second cladding layer.

4,567,061

METHOD FOR MANUFACTURE OF INSULATING FILM AND INTERFACE BETWEEN INSULATION FILM AND SEMICONDUCTOR

Yutaka Hayashi, Tanashi; Iwao Hamaguchi, Yokohama, and Kiyohiko Kobayashi, Yamato, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Continuation of Ser. No. 190,971, Sep. 26, 1980, abandoned. This application Jul. 30, 1984, Ser. No. 635,477

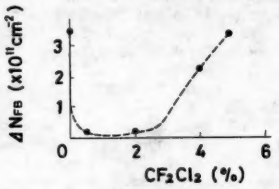
Claims priority, application Japan, Oct. 26, 1979, 54-138923

Int. Cl.[4] H01C *21/316*

U.S. Cl. 427—93 **3 Claims**

1. A thermal oxidation method for the manufacture of an insulating film and an interface between the insulation film and a semiconductor insulation film, which comprises:

heating a silicon substrate or a silicon dioxide based film having an interface state density to a temperature of about 800° C. to about 1200° C. in an atmosphere formed by incorporating a chlorine-containing carbon fluoride gas into an oxidizing gas in an amount of up to 6% by volume based on the combined volume of the chlorine containing carbon fluoride gas and the oxidizing gas, said treatment resulting in improved electrical properties of the semiconductor and of the interface between said insulation film and said semiconductor.



4,567,062

PROCESS FOR PHOTOFORMED PLASTIC MULTISTRATE USING TWO LAYER FILM

Roxy N. Fan, E. Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1984, Ser. No. 665,002

Int. Cl.[4] H05K *3/18*

U.S. Cl. 427—96 **9 Claims**

1. A process for preparing two layer printed circuits having conductive interconnections which comprises

(a) laminating simultaneously or sequentially to a substrate bearing a circuit pattern two photopolymerizable layers, a tacky lower layer (1), 0.0005 to 0.010 inch (0.013 to 0.254 mm) in thickness, formulated for bulk response comprising an elastomeric polymeric binding having a Tg of −10° C. or lower, an ethylenically unsaturated monomeric compound, and a photinitiator or photoinitiator system, and a tacky upper layer (2) thinner than lower layer (1) and having a maximum thickness of 0.0005 inch (0.013 mm), tacky upper layer (2) formulated for surface response having an optical density in the range of 0.3 to 1.5 in at least a portion of the actinic spectral region, comprising a nonelastomeric polymer binder, an ethylenically unsaturated monomeric compound which is the same or different from the monomeric compound in layer (1), and a photoinitiator or photoinitiator system which is the same or different from the photoinitiator or photoinitiator system in lower layer (1);

(b) exposing the laminate to actinic radiation through a registered circuit image which is related to the underlying circuit pattern having at least one segment thereof overlying at least one segment of the conductive circuit pattern wherein the unexposed areas of upper layer (2) remain tacky and the exposed areas of upper layer (2) become nontacky;

(c) embedding finely divided metal, alloy, or plating catalyst to the unexposed areas;

(d) optionally heating the metallized or catalyzed laminate;

(e) exposing the metallized or catalyzed laminate to actinic radiation through a registered via image of at least one overlying segment of the conductive circuit pattern;

(f) removing the unexposed areas of the photopolymerizable layers with a solvent therefor to form vias through layers (1) and (2), the sides of the vias corresponding to exposed layer (1) remaining tacky, whereby segments of the underlying circuit patterns are uncovered;

(g) embedding finely divided metal, alloy or plating catalyst material to the vias, the metal or catalyst being embedded into the sides of the vias;

(h) optionally curing the laminate by exposing the laminate to actinic radiation, and/or heating;

(i) plating electrolessly the metallized or catalyzed vias, the uncovered segments, and overlying circuit image to form an electrically conductive circuit pattern interconnected with electrically conductive vias.

4,567,063

PROCESS FOR PRODUCING MAGNETIC RECORDING MEDIA

Takahito Miyoshi, Odawara; Toshimitu Okutu, Minami-Ashigara; Masahiro Utumi, Hadano, and Masaaki Fujiyama, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Apr. 25, 1985, Ser. No. 727,216

Claims priority, application Japan, Apr. 27, 1984, 59-83693

Int. Cl.[4] H01F *10/00*; B05D *5/12*

U.S. Cl. 427—128 11 Claims

1. A process for the production of magnetic recording media including a nonmagnetic support having a magnetic layer on one side thereof, and a backing layer obtained by dispersing a filler in a binder on the other side thereof, in which said backing layer is provided by:

a first step of kneading and dispersing a filler and a binder by means of a roll mill to form chips,

a second step of dissolving said chips in a solvent followed by dispersion effected with a sand grinder, and

a third step of adding a curing agent to the obtained liquid dispersion, followed by coating.

4,567,064

METHOD AND APPARATUS FOR THE MARKING OF GAS-PERMEABLE FABRIC OF CLOTH WEBS AND OTHER MATERIAL WEBS, ESPECIALLY FOR THE AUTOMATIC MARKING IN A MARKING STATION

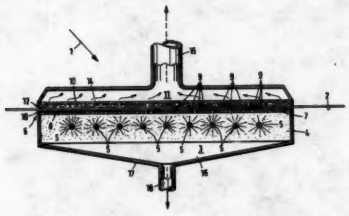
Josef Wöste, Greven, Fed. Rep. of Germany, assignor to Anton Cramer GmbH & Co. KG, Greven, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,089

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305907

Int. Cl.[4] B05D *1/32, 3/00*

U.S. Cl. 427—157 13 Claims



1. A method for the marking of a gas-permeable fabric or cloth webs or other material webs for a marking station comprising:

guiding the fabric web including inserting the fabric web in marking apparatus and severing marked fabric sections;

contacting the web with a film as a stencil positioned on the gas-permeable lower side of the fabric and including the pattern to be marked off in the form of perforations;

sucking an atomized paint through the perforations in the film from below to above the fabric web and through the contacting fabric web by a vacuum compartment having a gas-permeable lower side comprising a grate;

interposing between the grate and the fabric web a resilient gas-permeable material layer as a cushion;

abutting the vacuum compartment and the atomizing chamber against each other with the fabric web interposed therebetween and pressed down by the grate and cushion.

4,567,065

DISPENSER GLOVES AND STOCKINETTS AND METHODS OF MANUFACTURING SAME

Charles I. Schneiderman, 10021 Sorrel Ave., Potomac, Md. 20854

Continuation-in-part of Ser. No. 265,249, May 19, 1981, abandoned. This application Jan. 21, 1983, Ser. No. 459,704

Int. Cl.[4] A61M *7/00, 31/00*; B05D *7/22*

U.S. Cl. 427—230 10 Claims

1. A method of filling a dispensing device for fitting around a portion of the user's body with a treating agent, comprising:

placing said treating agent into a hollow form having a plurality of millipore openings;

placing said dispensing device over said hollow form; and

injecting said treating agent onto the interior surfaces of said dispensing device by forcing it through said plurality of millipore openings;

whereby said treating agent is uniformly distributed throughout substantially the entire interior surfaces of said dispensing device.

4,567,066

ELECTROLESS NICKEL PLATING OF ALUMINUM

Paul B. Schultz, Farmington, and Eugene F. Yarkosky, Milford, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Continuation of Ser. No. 525,358, Aug. 22, 1983, abandoned. This application Oct. 23, 1984, Ser. No. 663,826

Int. Cl.[4] C23C *3/02*

U.S. Cl. 427—305 9 Claims

1. In the process for plating a zinc coated aluminum surface with nickel the improvement wherein the turnover life of the primary electroless nickel plating bath is increased, said improvement comprising:

(a) applying a first coating of nickel on the zinc coated aluminum surface from an electroless nickel plating bath separate from said primary electroless nickel plating bath, said bath having a pH of about 2 to 12;

(b) applying a second coating of nickel on the first coating of nickel from said primary electroless nickel plating bath, said primary bath having a pH of about 2 to 7;

(c) said first coating being thinner than said second coating; and

(d) both of said electroless nickel plating baths containing a source of nickel ions and a reducing agent to reduce the nickel ions.

4,567,067

METHOD OF SURFACE TREATMENT OF ALUMINUM KILLED STEEL IN PREPARATION FOR PORCELAIN COATING

Charles Keal, Jr., Connersville, Ind., assignor to Design & Manufacturing Corporation, Connersville, Ind.

Filed Apr. 24, 1985, Ser. No. 726,684

Int. Cl.[4] B05D *7/14, 1/02, 3/10*

U.S. Cl. 427—328 14 Claims

1. A surface treatment process for metallic parts in preparation for porcelain coating thereof comprising the following steps:

(a) mounting aluminum killed steel parts on a conveyor;

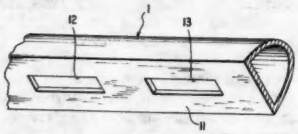
(b) spraying said parts with an aqueous non-silicate alkaline cleaning solution having a temperature of about 180° F. (about 82° C.);
(c) subjecting said parts to a first water rinse spraying treatment;
(d) spraying said parts with an aqueous ferric sulfate solution having a concentration of from about 0.5% to about 1% and a temperature of from about 155° F. to about 160° F. (about 68° C. to about 71° C.);
(e) subjecting said parts to a second water rinse spraying treatment;
(f) spraying said parts with an aqueous sulfuric acid solution having a concentration of about 2.5% and a temperature of about 140° F. (about 60° C.);
(g) subjecting said parts to a third water rinse spraying treatment;
(h) spraying said parts with an aqueous nickel sulfate solution and depositing on said aluminum killed steel parts a nickel adhesion layer of from about 0.04 to about 0.07 g./sq.ft.;
(i) spraying said parts with an aqueous sulfuric acid solution having a concentration of from about 0.35% to about 0.45% and a temperature of from about 130° F. to about 140° F. (about 54° C. to about 60° C.);
(j) spraying said parts with an alkaline neutralizer; and
(k) subjecting said parts to a final water rinse spraying treatment.

4,567,068

BLOW-MOLDED PLASTIC BODY

Ekkehard Weinberg, Schönwald, and Rolf Hameister, Hof/-Salle-Leimitz, both of Fed. Rep. of Germany, assignors to Rehau Plastiks AG & Co., Rehau, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,766
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308483
Int. Cl.⁴ B60R *13/00*
U.S. Cl. 428—31 **5 Claims**



1. In a blow-molded plastic hollow body including a bottom wall having an outer face adapted to be mounted on a base surface; the improvement comprising a plurality of defined, throughgoing apertures in said bottom wall; said apertures being spaced from one another by web-like parts of said bottom wall and having a total area of between 10% and 70% of the outer face of said bottom wall.

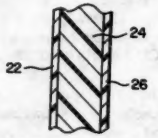
4,567,069

MULTILAYER CONTAINERS WITH IMPROVED STRESS CRACK PROPERTIES

Saleh A. Jabarin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 18, 1984, Ser. No. 621,352
Int. Cl.⁴ B65D *23/00*; B32B *27/08*
U.S. Cl. 428—35 **21 Claims**

1. A thermoformed or molded container whose walls are of sufficient thickness to be self-sustaining when used in the packaging of solid and liquid products which comprises a container whose bottom and side walls are fabricated from a multilayer polymeric material characterized in that (a) the inner layer of said multilayer material is relatively thin and constitutes not more than about 40% of the thickness of said multilayer material and is a linear low density ethylene polymer having a density of less than about 0.94 gm/ml and having polymerized therein about 2–6 mol % of an alpha-monoolefin containing about 3–12 carbons and the balance ethylene; and (b) the principal layer of said multilayer material is relatively thick and constitutes at least about 60% of the thickness of said multilayer material and is a linear high density ethylene polymer



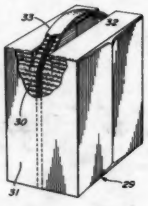
having a density of at least about 0.94 gm/ml, a melt index of less than about 5.0 gm/10 min. and having polymerized therein at least about 98 mol % ethylene with any comonomer polymerized therein being an alpha-monoolefin containing about 3 to 12 carbon atoms.

4,567,070

FIBROUS MATERIAL REINFORCING TAPE, METHOD OF MAKING THE SAME AND CONTAINERS REINFORCED BY SAID TAPE

Thomas J. Karass, 4645 Circle Rd., Montreal, Canada (H3W 1Z2)

Filed Jul. 20, 1984, Ser. No. 633,046
Int. Cl.⁴ B31B *1/72*; B65D *25/00*
U.S. Cl. 428—35 **18 Claims**



1. In combination, a container made of sheets of fibrous material, said sheets adhered together by glue, and a tape for reinforcing at least part of said container, said tape adhered flat to said fibrous material over substantially its entire length, said tape having a thickness lying between 0.05 and 0.30 millimeters, said tape being weftless and made of parallel yarn ends, each made of several fibers selected from the group consisting of polyester, rayon and polyamide fibers, and an adhesive bonding said yarn ends together, each said yarns end having a gauge range from 100 to 12,000 deniers, there being up to 350 yarn ends in the tape, said yarn ends being flattened with their major cross-sectional dimension parallel to the opposite main faces of the tape, said major cross-sectional dimension being greater than the diameter of the original round yarn ends used for making the tape by an amount varying between 35% and 100%, said adhesive filling the interstices between the yarn ends and providing a generally smooth surface at said main faces, said adhesive chosen to be compatible with said glue.

4,567,071

FAST-HEATING CATHODE

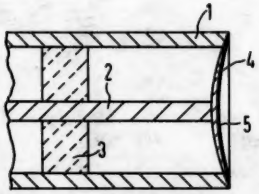
Erich Glass, Lindenweg 38, 8056 Neufahrn, and Hinrich Heynisch, Im Birket 7, 8032 Gräfelfing, both of Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,720

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323473

Int. Cl.[4] H01J *1/14*

U.S. Cl. 428—35 16 Claims



1. Directly heated oxide cathode, especially for velocity-modulated tubes in pulse operation, which comprises a cylindrical outer conductor, an inner conductor coaxially arranged within the cylindrical outer conductor, a ceramic support disc supporting and spacing the inner conductor from the outer conductor, a metal layer connected on one end face of the cathode to the outer conductor and the inner conductor, and an electron-emitting oxide layer disposed on the metal plate.

4,567,072

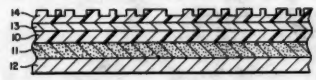
ARTICLE EXHIBITING APPARENT LUMINESCENCE AND ITS METHOD OF MANUFACTURE

Ron P. Brainard, Columbus, and L. Wayne Cassidy, Groveport, both of Ohio, assignors to Murfin Incorporated, Columbus, Ohio

Filed Sep. 21, 1984, Ser. No. 652,931

Int. Cl.[4] B05D *3/06;* C09J *7/02;* B32B *3/02*

U.S. Cl. 428—40 20 Claims



1. An article of manufacture comprising a base film of from 0.00025 to 0.375 inches in thickness and an ultra violet curable film of from 0.00025 to 0.010 inches in thickness on said base film, said ultraviolet curable film having a textured surface of randomly disposed elevated areas and depressed areas capable of appearing luminescent.

3. The article of manufacture of claim 1 wherein said base is transparent and is coated on the side opposite from the ultraviolet curable film with a transparent adhesive and a releasable backing strip.

4,567,073

COMPOSITE LOW SURFACE ENERGY LINER OF PERFLUOROPOLYETHER

James M. Larson, Minneapolis, and Allen L. Noreen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 394,534, Jul. 2, 1982, abandoned. This application May 21, 1984, Ser. No. 612,475

Int. Cl.[4] B32B *27/00;* C09J *7/02*

U.S. Cl. 428—40 9 Claims

1. A substrate having a composite liner comprising

an inner layer of polymer insoluble in methyl ethyl ketone at 20° C. and made from polymerizable, film-forming monomer having a polymerization functionality greater than 1, and

an outer layer of polymer insoluble in 1,1,2-trichloro-2,2,1-trifluoroethane at 20° C., made from a polymerizable film-forming monomer copolymerizable with the monomer used to make said inner layer, and comprising a perfluoropolyether segment which comprises a plurality of $-C_aF_{2a}O-$ repeating units, where subscript a in each such unit is independently an integer from 1 to 4.

4,567,074

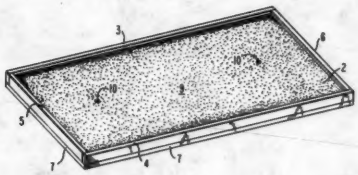
INSULATING TRAP DOOR COVER

Stephen H. Litaker, 5407 Autumn End Cir., Charlotte, N.C. 28212

Filed Mar. 21, 1985, Ser. No. 714,476

Int. Cl.[4] B32B *1/04, 3/02;* A62B *3/00;* E06C *7/00*

U.S. Cl. 428—71 5 Claims



1. An insulating cover adapted to fit over a trap door comprising:

a. A slab of thermal insulating material made of rigid foam of a size sufficiently large to fit over the trap door;

b. A frame having side walls and said side walls having a lower face and the inside dimensions of the frame are of the same size as are the outside dimensions of the slab;

c. Molding means securely connected to the lower face of the side walls forming a lip extending inwardly and around the periphery of the frame whereby the slab is adhesively affixed to the lip; and

d. Fastening means for removably attaching said cover to said trap door.

4,567,075

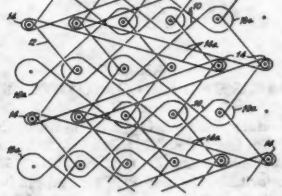
DOUBLE FACED KNIT FABRIC AND METHOD

Simon W. Krawczyk, Forest Hills, N.Y., assignor to Fab Industries, Inc., New York, N.Y.

Filed May 20, 1983, Ser. No. 496,434

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—91 15 Claims



1. A double faced knit fabric having particular utility as a bedding blanket, said fabric being of at least three bar construction and comprised of:

a support substrate of warp-knit yarns;

a first facing of warp knit, overfed looped and napped yarns knit into said support substrate; and,

an opposite facing of warp-knit napped floats of yarns, the

yarns of said opposite facing being knit into said support substrate at the ends of the floats;

the fibers of said substrate being substantially intact and unbroken, and providing longitudinal stability to said fabric;

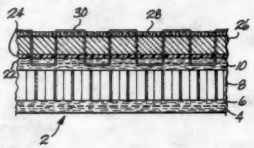
at least a portion of the fibers of said opposite facing being intact and unbroken and providing lateral stability to said fabric.

4,567,076

COMPOSITE MATERIAL STRUCTURE WITH INTEGRATED INSULATING BLANKET AND METHOD OF MANUFACTURE

Keith E. Therrien, Wausau, Wis., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 23, 1984, Ser. No. 592,539
Int. Cl.[4] B32B *3/06*
U.S. Cl. 428—102 **8 Claims**



1. A load-bearing composite material structure with integral thermal and flame protection, said structure comprising:

a first ply of composite material, and an integral blanket bonded to said first ply;

said first ply including a thermosetting matrix material, and a fibrous material reinforcing the matrix material; and

said integral blanket including:

an inner face sheet formed by a second ply of composite material, said second ply including a thermosetting matrix material reinforced by a fibrous material;

an outer face sheet that is resistant to flame penetration;

a layer of insulation fill between said inner and outer face sheets of sufficient thickness and sufficiently low thermal conductivity to provide a predetermined degree of thermal insulation; and

high temperature resistant thread stitched through the layers of the blanket to sew such layers together;

said first and second plies being cured together, after the layers of the blanket are stitched together, to bond said plies together to in turn bond the blanket to said first ply and integrate the blanket into the structure.

4,567,077

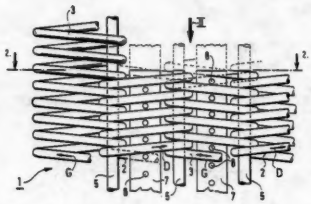
PAPERMAKER'S FABRIC CONSTITUTED BY PLASTIC SPIRALS

Maurice Gauthier, Hiersac, France, assignor to Cofpa, France

Continuation of Ser. No. 403,733, Jul. 14, 1982, abandoned. This application Mar. 22, 1985, Ser. No. 715,195
Claims priority, application PCT Int'l Appl., Nov. 13, 1980, PCT/FR81/00146; France, Nov. 14, 1980, 80 24221
Int. Cl.[4] D21F *1/10*; F26B *13/08*
U.S. Cl. 428—114 **4 Claims**

1. In a papermaker's fabric comprising a plurality of transverse synthetic spirals connected together serially to define a supporting surface for transporting a paper web through papermaking machinery said supporting surface during a predetermined permeability, the improvement comprising:

generally flat synthetic bars disposed within said spirals, said flat synthetic bars including selectively sized apertures defined at regular intervals along the length of said bars



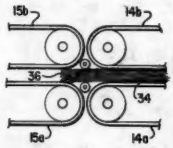
such that a desired reduction in the permeability of said papermaker's fabric is achieved.

4,567,078

PROCESS AND APPARATUS TO CRIMP FIBRES

Phillip W. Blackmore, Camlachie; William T. Fletcher, and Terry B. Burn, both of Sarnia, all of Canada, assignors to Fiberglas Canada Inc., Toronto, Canada

Filed Sep. 11, 1984, Ser. No. 649,556
Claims priority, application Canada, Jul. 3, 1984, 456851
Int. Cl.[4] D04H *13/00*
U.S. Cl. 428—119 **30 Claims**



1. A method of producing a non-pleated reoriented glass fiber material having improved bending strength, said method comprising the steps of:

advancing a mat of glass fibers arranged in laminations extending at least substantially parallel to opposite major surfaces of said mat;

impregnating said mat with a heat-curable bonding substance;

passing said mat along a gap extending between successive driven elongate conveyor means which engage the opposite major surfaces of said mat to control the advance of said mat along said gap;

driving said conveyor means at progressively slower speeds along said gap while deforming said laminations of said mat in at least two separate stages into a non-pleated reorientation in which at least a major portion of said laminations extend across the thickness of said mat; and

subsequently heating said mat to cure said bonding substance.

4,567,079

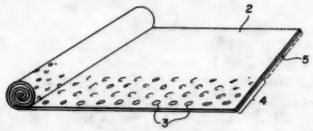
HIGH-STRENGTH BUILT-UP ROOFING USING IMPROVED PLY SHEETS

V. Robert Canfield, Martinsville; William J. Woodring, Bound Brook, and Mira C. Kubiak, North Brunswick, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Oct. 1, 1984, Ser. No. 656,213
Int. Cl.[4] B32B *3/02, 3/10, 11/10*
U.S. Cl. 428—131 **12 Claims**

1. A BUR ply comprising a felt sheet having a restricted perforated marginal along one longitudinal edge said marginal area occupying from ¼ to 1/5 the width of the sheet and said

perforations within said area having offset center spacing of between about 0.5 and about 5 inches and being defined by a



size and shape sufficient to allow ready flow through of a bitumen or coal tar bonding agent.

4,567,080

VAPOR BARRIER

Vagn Korsgaard, Horsholm, Denmark, assignor to V.I.K.-Consult ApS, Horsholm, Denmark

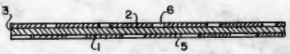
PCT No. PCT/DK84/00056, § 371 Date Feb. 20, 1985, § 102(e) Date Feb. 20, 1985, PCT Pub. No. WO85/00188, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 19, 1984, Ser. No. 711,582

Claims priority, application Denmark, Jun. 20, 1983, 2840/83; Dec. 7, 1983, 5634/83

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—137 **8 Claims**



1. Vapour barrier comprising a layer of a vapour-tight (vapour impervious) material connected with a layer of water absorbing material, openings permitting the passage of vapour and water being provided in the layer of vapour-tight material, characterized in that it comprises two vapour-tight layers (1,2;11) and a water absorbing layer (3,10) disposed therebetween, openings (5,6;12) being provided in both vapour-tight layers (1,2;11), the openings (5,12) in one layer (1,11) being arranged in displaced positions relatively to the openings (6,12) in the other layer (2,11).

4,567,081

SEPARATOR SHEETS FOR COLLATION WITH A STACK OF TRANSPARENCIES

Arthur C. VanHorne, Lake Oswego, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 18, 1984, Ser. No. 631,970

Int. Cl.[4] B32B *3/24, 5/18*

U.S. Cl. 428—138 **1 Claim**

1. A collated stack for a reproduction machine having a vacuum paper handling mechanism, said collated stack comprising a plurality of substantially impermeable copier sheets made from a transparent thermoplastic material, and a plurality of permeable separator sheets provided with a plurality of holes covering substantially the entire surface area of said separator sheets, said separator sheets being alternately interleaved with said plurality of copier sheets.

4,567,082

NONREFLECTIVE AND LIMITATIVELY LIGHT-TRANSMITTING BOARD

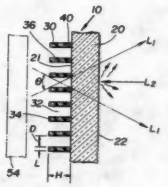
Hiroshi Tabata, Yokohama, and Yasuaki Kai, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 8, 1985, Ser. No. 700,112

Claims priority, application Japan, Feb. 13, 1984, 59-22779

Int. Cl.[4] B32B *3/24*

U.S. Cl. 428—138 **7 Claims**



1. A nonreflective and limitatively light-transmitting board suitable for use as a front cover of a vehicle instrument panel, the board comprising:

a transparent plate having a front major surface which is finished to a surface roughness in the range from 0.15 to 0.40 μm so as to become a diffusely reflective surface; and

an opaque shade film which is bonded to the back major surface of said transparent plate and is formed with a number of substantially uniformly distributed light-transmitting holes which are circular or polygonal in cross-sectional shape, the ratio of the diameter, or the diameter of the inscribed circle, of said holes to the depth of said holes being greater than 0.23 and smaller than 0.5, the ratio of said diameter to the distance of each of said holes from every adjacent one of said holes being greater than 1.2 and smaller than 25.

4,567,083

MAGNETIC RECORDING MEDIUM

Hiroyuki Arioka, Saku; Masaharu Nishimatsu, Komoro, and Akio Watanabe, Usuda, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 16, 1984, Ser. No. 661,499

Claims priority, application Japan, Oct. 17, 1983, 58-192562; Oct. 17, 1983, 58-192563

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—141 **13 Claims**

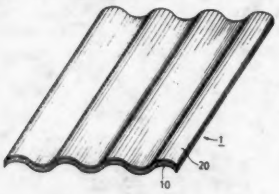
1. A magnetic recording medium comprising a magnetic layer formed on a plastic base and having a perpendicular magnetic anisotropy suited for perpendicular magnetization, a back coating being formed on the side of the base opposite the magnetic side, said back coating being a thermoset coating cured from a thermosetting composition comprising a vinyl chloride-vinyl acetate-vinyl alcohol copolymer, a polyurethane resin, and a polyisocyanate, or a radiation-cured coating cured from a radiation-curable composition containing at least one component having at least one acrylic, maleic, or allylic double bond, said back coating having an asperity in the range of 0.04 to 0.6 μm and wherein the asperity of the magnetic layer is of not more than 0.08 μm.

4,567,084

MULTILAYERED CORRUGATED ROOFING

Lin Juei Jse, 4th Fl., No. 37-39, Sec. 2, Shih Chuan Rd., Panchiao City, Taiwan

Filed Mar. 12, 1984, Ser. No. 588,943
Int. Cl.[4] D06N 7/04; B32B 3/28, 3/30; B05D 3/02
U.S. Cl. 428—150 16 Claims



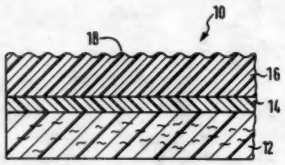
1. A multilayered corrugated roofing comprising:
a corrugated heat proof substrate; and
an exterior layer of a coherent substance on the top surface of said substrate, said dried substance constituted of effective amounts of dolomite, magnesite, and white cement.

4,567,085

FLOOR COVERING, ESPECIALLY FOR AIRPLANES

Mathias Gey, Buxtehude; Jürgen Grote, Hamburg; Horst Pittel, Munich; Gerd W. Samol, Heimenkirch, and Rainer Zelt, Lindau, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,280
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304232
Int. Cl.[4] B32B 3/30, 25/02, 25/08, 25/20
U.S. Cl. 428—163 14 Claims



1. Floor covering, comprising a substrate in the form of a resin based laminate having reinforcing fibers disposed therein, and a layer of fire-resistant polysiloxane composition vulcanized on the surface of said laminate, said polysiloxane composition comprising

(a) a diorganopolysiloxane of the formula

$$R_n{}^1SiO_{\frac{4-n}{2}}$$

in which n is 1.9 to 2.05, and R^1 is an alkyl, alkenyl and/or aryl radical with 1–8 C-atoms,

(b) a finely divided silicic acid,

(c) finely divided TiO_2 with a surface area, measured by the BET method, greater than 20 m^2/g and a particle size less than 0.5 μm,

(d) platinum and/or one of its sulphur-free compounds,

(e) a curing agent, and

(f) a nitrogen compound selected from the group consisting of uric acid, guanine, melamine and a compound of the general formula

in which

R is H, phenyl, alkyl with 1–6 C atoms, tolyl, nitrile, $-NHR^2$, $-CH_2OR^2$, $-CH_2COOR^2$, $-C(=NH)NHR^2$, $-CO-NH-R^2$ or $(R^1)_2C-$,

R^1 is H, alkyl with 1–6 C atoms, $Si(CH_3)_3-$ or R

R^2 is H or —CO—R and

Z is NH, O or NR, or a salt thereof.

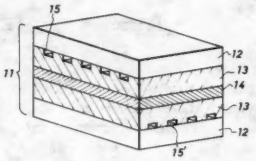
14. Floor covering according to claim 1, wherein said polysiloxane layer has an upper surface having grooves formed therein.

4,567,086

CARBONACEOUS, FIVE-LAYER FUEL CELL ELECTRODE SUBSTRATE WITH ELONGATED HOLES FOR FEEDING REACTANT GASES

Hiroyuki Fukuda; Masatomo Shigeta; Hisatsugu Kaji, all of Iwaki, and Kuniyuki Saitoh, Abiko, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1985, Ser. No. 718,382
Claims priority, application Japan, Apr. 4, 1984, 59-68059
Int. Cl.[4] B32B 3/12, 9/00
U.S. Cl. 428—166 5 Claims



1. An electrode substrate for fuel cells which comprises a porous carbonaceous layer, a dense carbonaceous layer having a bulk density larger than the porous layer, a separator, a dense carbonaceous layer having a bulk density larger than the porous layer, and a porous carbonaceous layer, and which further comprises a number of elongated holes for feeding reactant gases into a fuel cell in the interface between the porous layer and the dense layer.

4,567,087

SCUFF RESISTANCE IN ABRASION-RESISTANT LAMINATES

Robin D. O'Dell, Pasadena; Israel S. Ungar, and Herbert I. Scher, both of Randallstown, all of Md., assignors to Nevamar Corporation, Odenton, Md.

Filed Jun. 28, 1983, Ser. No. 508,629
The portion of the term of this patent subsequent to Dec. 12, 2002, has been disclaimed.
Int. Cl.[4] B32B 3/00, 7/14, 5/18, 9/06
U.S. Cl. 428—211 20 Claims

1. In a decor sheet for use as a decorative facing sheet in the manufacture of abrasion-resistant decorative laminates, said decor sheet having thereon an ultra-thin facing layer comprising abrasion-resistant particles and sufficient binder material for said particles to bind said abrasion-resistant particles to the surface of said decor sheet, said decor sheet being impregnated with a thermosetting resin compatible with said binder material, the improvement wherein

said ultra-thin layer also contains a solid, particulate lubricant, having a melting point of at least 140° F., in an amount sufficient such that, during use of the decor sheet

to make decorative laminate, the particular lubricant melts and blooms to the surface thereby providing an abrasion-resistant laminate having simultaneously good clarity, excellent abrasion resistance and improved stain and scuff resistance, with the proviso that said solid lubricant is not an oxidized wax or a silicone resin.

18. In a method of producing an abrasion-resistant decorative laminate from at least one backing layer and a thermosetting resin impregnated decor facing sheet, said laminate having enhanced abrasion resistance without an overlay layer, the method comprising providing a decorative facing sheet with an ultra-thin layer of abrasion-resistant particles and sufficient binder material for said particles to bind said particles to the suffice of said decor sheet and with an impregnant of a polyester or melamine-formaldehyde thermosetting resin; assembling said resin-impregnated and coated decor sheet over said backing layer; and subjecting said assembly to heat and pressure to consolidate said backing layer and said decor sheet to thereby provide said abrasion-resistant decorative laminate; the improvement wherein

said ultra-thin wet layer further includes a solid, particulate lubricant, having a melting point of at least 140° F., in an amount sufficient such that during said consolidation step, the particulate lubriant melts and blooms to the surface thereby providing an abrasion-resistant laminate having simultaneously good clarity, excellent abrasion resistance and improved stain and scuff resistance, with the proviso that said solid lubricant is not an oxidized wax or a silicone resin; wherein said consolidation step is carried out at a temperature greater than the melting temperature of said solid, particulate lubricant.

19. A method according to claim **18**, wherein said decorative facing sheet is provided with said ultra-thin layer and with said impregnant by the steps of

coating said decorative facing sheet with said ultra-thin layer of said abrasion-resistant particles and said binder material in a wet layer, drying said wet layer on said decor sheet at a temperature of about 170°–190° F. but less than the melting temperature of said solid, particulate lubricant and thereby providing a dried ultra-thin layer in which said abrasion-resistant particles are bound to the surface of said decor sheet by said binder material, and impregnating said coated decor sheet with said thermosetting resin impregnant; and

wherein said solid particulate lubricant is a polyethylene wax having a particle size less than 30 microns, having a melting temperature of less than 260° F. and preferably 220°–230° F.

4,567,088

SANDWICH MATERIAL

Bengt G. Skogman; Hans T. Svensson, and Eduardo E. Torres, all of Karlstad, Sweden, assignors to Karlstad Vulk and Montage Aktiebolag, both of Karlstad, Sweden

Filed Oct. 23, 1984, Ser. No. 664,394
Claims priority, application Sweden, Nov. 11, 1983, 8306207
Int. Cl.[4] B32B *7/02, 27/40*
U.S. Cl. 428—213 **15 Claims**

1. A shock absorbing and resilient composite comprising a first layer of predetermined thickness consisting essentially of a polymeric substance having a hardness of between 85° and 100° Shore A; a second layer of predetermined thickness consisting essentially of a rubber having a hardness of between 50° and 70° Shore A, but softer than said first layer; and a third layer of predetermined thickness consisting essentially of a rubber having a hardness of between 20° and 50° Shore A, but softer than said second layer; said second layer disposed between said first and said third layers; said second layer having a thickness greater than or equal to the thickness of said first layer and less than or equal to three times the thickness of said first layer; said third layer having a thickness greater than or equal to the thickness of said second layer and less than or equal to three times the thickness of said second layer.

15. A shock absorbing element to be arranged under a conveyor belt at the area of loading comprising a carrier provided with a shock absorbing coating facing the bottom side of the conveyor belt; said shock absorbing coating comprising a first layer of predetermined thickness consisting essentially of a polymeric substance having a hardness of between 85° and 100° Shore A, a second layer of predetermined thickness consisting essentially of a rubber having a hardness of between 50° and 70° Shore A, but softer than said first layer, and a third layer of predetermined thickness consisting essentially of a rubber having a hardness of between 20° and 50° Shore A, but softer than said second layer, said second layer disposed between said first and third layers, said second layer having a thickness greater than or equal to the thickness of said first layer and less than or equal to three times the thickness of said first layer, said third layer having a thickness greater than or equal to said second layer and less than or equal to three times the thickness of said second layer; said third layer adjacent said carrier.

4,567,089

THERMOFORMING PROPYLENE POLYMER LAMINATED SHEET

Satoru Hattori; Takao Yazaki; Kazuhide Hattori; Koji Nishida; Hideki Hattori, and Kazumasa Fujimura, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,458
Int. Cl.[4] B32B *7/02*
U.S. Cl. 428—213 **19 Claims**

1. A thermoforming propylene polymer laminated sheet consisting essentially of:

at least two layers, at least one of which is a surface layer A having a thickness of from 0.5 to 45% of the total thickness of the sheet, and wherein at least one other layer is layer B having a thickness of from 55 to 99.5% of the total thickness of the sheet, said layer A comprising from 100 to 95% by weight of a crystalline propylene polymer having a melt flow rate of from 1 to 8 g/10 min, a propylene content of at least 95% by weight and a Q value of at least 3.5 and from 0 to 5% by weight of an inorganic or organic nucleating agent, and said layer B being of a composition having a melt flow rate of no more than 2 g/10 min and comprising from 40 to 95 parts by weight of a resin component and from 60 to 5 parts by weight of an inorganic filler, said resin component comprising from 5 to 85% by weight of a crystalline propylene polymer having a Q value of at least 8 and from 95 to 15% by weight of an ethylene polymer having a Q value of no more than 9.

4,567,090

HEAT-RESISTANT LAMINATE FILM

Masaki Ohya, and Yoshihiro Matsukura, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,793
Claims priority, application Japan, Aug. 21, 1979, 54-106584; Jul. 25, 1983, 58-124646; Apr. 11, 1984, 59-72433
Int. Cl.[4] B32B 7/02
U.S. Cl. 428—214 5 Claims

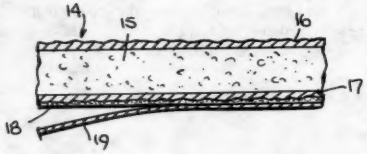
1. A heat-resistant laminate film comprising a gasbarrier layer of a copolymer of vinylidene chloride and at least one comonomer copolymerizable with vinylidene chloride, outer layers of polypropylene and two adhesive layers of polyolefin modified by acid and thermoplastic polyurethane disposed between any of the above layers and bonded with each other, the modified polyolefin adhesive layer being bonded to the outer layer and the thermoplastic polyurethane adhesive layer being bonded to the gas-barrier layer.

4,567,091

ADHESIVE SPORTS TAPE

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Jun. 27, 1985, Ser. No. 749,387
Int. Cl.[4] D03D 13/00; B32B 1/00, 5/14
U.S. Cl. 428—222 7 Claims



1. A sheath formed on a handle by helically winding an adhesive sports tape thereon in superposed convoluted layers to pneumatically cushion the handle, said tape comprising a flexible band having an open-cell foam plastic core and opposing facing skins integral with the core, the inner skin being coated with a layer of pressure-sensitive material, the skins being gas-impermeable and the cells in the core being filled with gas which is entrapped within the tape by the skins whereby when the sheath formed by the tape is compressed by the hand of the user, the gas is then compressed; and when the manual pressure is released, the expanding gas causes the sheath to rebound.

4,567,092

COMPOSITE MATERIAL AND ITS APPLICATION TO REINFORCEMENT IN INSULATING PANELS

Yves Catrain; Claude Guerrier, both of Brignoud, and Jacques Revol, Eaubonne, all of France, assignors to SCAL Societe de Conditionnements en Aluminium, Paris, France

Filed Oct. 7, 1983, Ser. No. 539,950
Claims priority, application France, Oct. 11, 1982, 82 17333
Int. Cl.[4] B32B 7/00; D03D 3/00; D04B 1/00; D04H 1/00
U.S. Cl. 428—246 4 Claims

1. A composite material comprising:
(i) an aluminum sheet, and
(ii) a reinforcement means formed of a fabric of glass mono- or multifiber yarn or an organic material;
wherein the aluminum sheet is bound to the reinforcement means by a thermofusible composition comprising an ethylene copolymer, polypropylene or a polypropylene copolymer; wherein the thermofusible composition further comprises a fire-resistant agent which is at least one member selected from the group consisting of a bromo-aromatic derivative, a chloro-organic derivative, aluminum trihydrate, antimony trioxide and an antioxidizing agent; said fire-resistant agent being used in an amount of 70 to 90% by weight in the thermofusible composition.

4,567,093

RUBBER COATED FABRIC

Yoji Sogabe, Ashikaga; Katsumi Uchida, Ohta, and Kunihiko Harada, Ashikaga, all of Japan, assignors to Achilles Corporation, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,010
Int. Cl.[4] B32B 25/10, 25/02, 5/28
U.S. Cl. 428—250 1 Claim

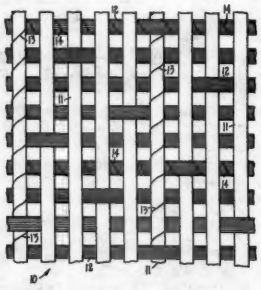
1. A rubber coated fabric comprising a base fabric and a coating material laminated on at least one side of said base fabric, said coating material comprising as its main ingredients, a product of reaction between liquid rubber and polyisocyanate wherein dusting powder is applied to the surface of said coating material, and said dusting powder is a reactive dusting powder containing a hydroxyl group capable of reacting with said polyisocyanate.

4,567,094

HIGH CONDUCTIVITY GRAPHITE MATERIAL AND METHOD OF WEAVING

Jordan Levin, Winona, Minn., assignor to Fiberite Corporation, Winona, Minn.

Division of Ser. No. 217,707, Dec. 18, 1980. This application Mar. 19, 1984, Ser. No. 590,640
Int. Cl.[4] D03D 15/00, 15/02
U.S. Cl. 428—256 12 Claims



1. A method for preparing a woven, drapable, electrically conductive graphite fabric having warp elements and fill elements which comprises the steps of:
(a) Forming an electrically conductive weavable multifilament graphite element by wrapping around a parent multifilament graphite element, having from about 1,000 to about 200,000 graphite fibers, at least one electrically conductive filament having a diameter substantially less than the largest cross-section dimension of the multifilament graphite element, the electrically conductive filament thereby being combined with the graphite element such that the resultant composite graphite element member retains the high stiffness of the parent multifilament graphite element; and
(b) weaving the electrically conductive weavable multifilament graphite element with multifilament graphite elements which have not been wrapped with a conductive filament such that every electrically conductive weavable multifilament graphite element is immediately adjacent to a parallel, relatively non-conductive multifilament graphite element.

4,567,095

ASPHALT FOAM

Joseph A. Cogliano, Pasadena, Md., assignor to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 646,779, Sep. 4, 1984, Pat. No. 4,524,156.
This application May 14, 1985, Ser. No. 734,009
Int. Cl.[4] B32B *3/26, 5/18*
U.S. Cl. 428—314.4 6 Claims

1. An insulated structure having a waterproofing layer and an insulating layer applied to its surface, the improvement comprising that said insulating layer is a porous structure comprising a foam of closed cellular configuration formed from a substantially homogeneous blend of from about 80 to 120 parts by weight asphalt and from about 5 to 25 parts by weight of a polyvalent metal salt of an anionic group containing polymer selected from polyvalent metal salt neutralized sulfonated polymers or neutralized carboxylated polymers; said foam having a bulk density of less than about 9 pounds per cubic foot and a pore volume of at least about 85 percent.

4,567,096

HYDRATED ALUMINA BINDER SYSTEM

Douglas H. Piltingsrud, and John C. S. Shen, both of Rochester, Minn.

Filed Mar. 21, 1985, Ser. No. 714,331
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—315.5 6 Claims

1. A rigid magnetic recording medium having finely divided magnetic particles dispersed in a thermosetting resin binder composition applied as a film having a thickness not exceeding one micron in thickness, closely adhered to a rigid nonmagnetic substrate wherein the coating composition includes 50 to 80 percent by weight of magnetic particles, 20 to 50 percent by weight of binder and comprises

finely comminuted hydrated alumina which release a controlled quantity of hydrated water molecules between 200° F. and 360° F. in a concentration of 1% to 5% by weight of magnetic particles;

said binder is formed of a blocked isocyanate that becomes deblocked at a temperature of 250 to 300 degrees F. and an oligomer wherein the NCO-OH ratio is 1.1 to 1.5, an additive for controlling porosity size in the cured binder which comprises 0.5% to 3% by weight of the total binder system; and

said coating composition is applied to said substrate and cured at 300 to 400 degrees F. until the cross linking reaction is complete, whereby the cured thermoset coating possesses liquid lubricant retention capability as a high porosity open cell structure wherein the individual voids do not exceed the magnetic bit cell size.

4,567,097

COMPOSITE HEAT-INSULATING MATERIAL

Takao Yazaki; Kazuhide Hattori; Takumi Matsuno; Kazuhide Hayama; Isao Ito, and Yukio Saito, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Mitsubishi Yuka Fine Chemical Co., both of Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,253
Claims priority, application Japan, Jan. 12, 1984, 59-3800; Jun. 21, 1984, 59-128216
Int. Cl.[4] B32B *3/26, 7/12, 27/04*
U.S. Cl. 428—317.7 9 Claims

1. A composite heat-insulating material having the structure that an olefin- or styrene-based resin and a urethane foam are laminated with an adhesive, said adhesive comprising

(A) 20 to 100% by weight of a water-soluble or water-dispersible carboxyl group-containing polyolefin-based polymer;

(B) 0 to 80% by weight of a nitrogen-atom containing water-soluble polymer having an antistatic property; and

(C) 0 to 2% by weight of a fluorine-based surface active agent.

4,567,098

METALLIZED PAPER AND METHOD OF ITS PRODUCTION

Franz-Josef Becker; Erich Hübner, and Walter Lammerich, all of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Zanders Feinpaiere AG, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,216
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225658
Int. Cl.[4] B32B *23/08, 27/10, 15/10, 15/12*
U.S. Cl. 428—327 19 Claims

1. A high gloss metallized paper whose metal layer is deposited onto a non-enamelled cast-coated paper by evaporation in vacuo, said paper having a cast coating containing mineral pigments, synthetic polymer pigments, latex binders and conventional additives and being characterized in that the cast coating is made with a coating material having a pH value >7 and is present in an amount of 15–30 g/m^2, that the cast coating contains per 100 parts by weight of pigments from 95 to 20 parts by weight of mineral pigments and from 5 to 80 parts by weight of synthetic polymer pigment and that for each 100 parts by weight of pigment there are present 5–25 parts by weight of a film-binding binder, said metal layer being directly on said cast coating.

8. The metallized paper according to claim 7, characterized in that the cast coating contains up to 25 percent by weight of plasticizers relative to the synthetic polymer pigment.

4,567,099

HIGH SOLIDS LATEXES FOR PAPER COATINGS

Ron L. Van Gilder, and Do I. Lee, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

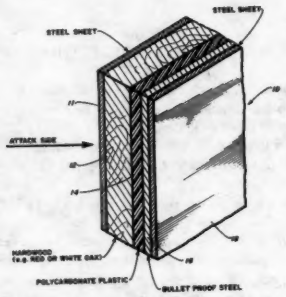
Filed Dec. 21, 1984, Ser. No. 684,876
Int. Cl.[4] B32B *27/10*
U.S. Cl. 428—327 24 Claims

1. A high solids formulation for coating paper which comprises an aqueous medium having dispersed therein a functionally effective amount of a finely divided mineral filler and a high solids synthetic bimodal latex comprising two separate and distinct particle size distributions and comprising in polymerized form open chain conjugated diene and alkenyl mononuclear aromatic monomers; wherein each of said distributions comprises particles which are substantially uniform in diameter such that said latex, when mixed with said filler in said aqueous medium, provides a coating formulation which approaches a viscosity which is no longer manageable at a higher solids content than that solids content exhibited by a formulation comprising an aqueous medium, a filler and a monodisperse or highly multi-disperse latex; whereby the small latex particles of said distribution of the bimodal latex provides an increase in the solids content and a decrease in viscosity at high shear of the formulation over that of a formulation comprising a monodisperse latex of a particle size similar to that of the large latex particle distribution of the bimodal latex; and whereby the large latex particle distribution of the bimodal latex are heterogeneous in nature and are capable of increasing the solids content of the formulation at low shear over that of a formulation comprising a monodisperse latex of a particle size similar to that of the small latex particle distribution of the bimodal latex.

4,567,100
FORCED ENTRY AND BALLISTIC RESISTANT LAMINAR STRUCTURE

Teddy L. Pickett, and Gary R. Cook, both of Ventura, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1983, Ser. No. 525,340
Int. Cl.⁴ E04B *2/02*
U.S. Cl. 428—339 **12 Claims**



1. A composite laminar panel structure capable of resisting penetration from attack by cutting tools, heat, small arms, projectiles and explosive forces, consisting in order of sequence from an attack side to the back side of the panel structure:

a. a first relatively thin metal sheet which faces the direction of attack;

b. a relatively thick layer of penetration and flame resistant hardwood disposed behind and adhered to said first metal sheet; said hardwood layer being chemically treated to reduce flamability thereof and delay thermal attack tools;

c. a high ballistic resistant and flame resistant plastic sheet disposed and adhered to said panel of hardwood;

d. a second metal sheet consisting of a relatively thin layer of armor plate metal disposed behind and adhered to said high ballistic resistant plastic layer; said sequence of materials laminated in said specific order from the attack side of the panel structure providing a laminar wall system having higher penetration resistance over comparable thickness and weight prior ballistic resistant wall structures.

4,567,101
FERRIMAGNETIC SPINEL FIBERS

Lawrence D. David, Florham Park, and Richard M. Arons, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 487,400, Apr. 21, 1983, Pat. No. 4,485,085. This application Sep. 26, 1984, Ser. No. 654,474
Int. Cl.⁴ D02G *3/00*
U.S. Cl. 428—364 **3 Claims**

1. Ferrimagnetic spinel fibers comprising ferrite particles corresponding to the formula:

$$M_1Fe_2O_4$$

where M is manganese, iron, cobalt, nickel, copper, zinc, cadmium, magnesium, barium, strontium, or any combination thereof; and wherein the average size of the ferrite particles is less than about 1000 Angstroms.

4,567,102
HOT MELT SIZE

Jean-Claude Pollet, Granville; Gordon P. Armstrong, Newark, and Martin C. Flautt, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

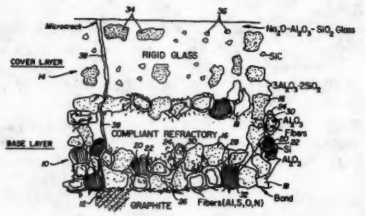
Filed May 24, 1984, Ser. No. 613,940
Int. Cl.⁴ B32B *9/00, 25/20*
U.S. Cl. 428—391 **9 Claims**

1. A glass fiber having on its surface a coating consisting of an ethylene-ethylacrylate copolymer, a low molecular weight polyethylene wax, a phenolic-modified terpene resin, and an organosilane.

4,567,103
CARBONACEOUS ARTICLES HAVING OXIDATION PROHIBITIVE COATINGS THEREON

Raymond V. Sara, Parma, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 518,192, Jul. 28, 1983, abandoned. This application Jul. 12, 1984, Ser. No. 628,516
Int. Cl.⁴ B32B *9/00*; B05D *3/02, 5/12*
U.S. Cl. 428—408 **102 Claims**



1. An article comprising a carbonaceous substrate and an oxidation prohibitive coating overlying and bonded to said substrate, said coating comprising a compliant, low strength, porous, particulate, sintered, ceramic, refractory material containing mullite as a major ingredient.

12. An article comprising a carbonaceous substrate and an oxidation prohibitive coating thereon, said coating comprising a base layer overlying and bonded to said substrate, said base layer being composed of a compliant, low strength, porous, sintered, particulate, ceramic, refractory material containing mullite as a major ingredient, said material having a tensile strength which is substantially less than the shear strength of the interfacial bond between said base layer and said substrate, and a cover layer overlying and bonded to said base layer comprising a rigid, glassy substance which is plastic and flowable at temperatures above about 750° C.

4,567,104
HIGH ENERGY BEAM COLORED GLASSES EXHIBITING INSENSITIVITY TO ACTINIC RADIATION

Che-Kuang Wu, Riverside, Calif., assignor to Canyon Materials Research & Engineering, Riverside, Calif.

Filed Jun. 24, 1983, Ser. No. 507,681
Int. Cl.⁴ C03C *15/00*
U.S. Cl. 428—410 **114 Claims**

1. A glass article comprising a body portion and an integral ion-exchanged surface layer (IIES layer), said glass article exhibiting the following properties:

(a) sensitivity to high energy beams; and

(b) insensitivity to at least a spectral portion of actinic radiation, and being insensitive to radiation of shorter wavelengths as concentration of TiO_2 in chloride containing glass composition of the glass article increases;

said body portion composed of a glass composition consisting essentially of, in mole percent on the oxide basis,

5–25% of one or more alkali metal oxides,

at least 1.5% TiO_2, but not exceeding 35% TiO_2, the composition containing at least an effective amount of TiO_2 to render the IIES layer insensitive to at least a spectral portion of actinic radiation,

up to 20% MgO,

up to 20% CaO,

up to 20% ZnO,

up to 15% Al_2O_3,

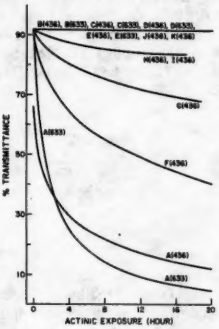
up to 20% PbO,

up to 20% BaO,

up to 25% B_2O_3,

up to 25% P_2O_5,

2–35% of at least one acid-durability-and-glass-network-strengthener (ADAGNS) selected from the group consisting of MgO, ZnO, Al_2O_3, PbO, and CaO,



up to 4% F,

up to 2% Br,

up to 2% I,

up to 6% Cl, and

50–89% SiO_2,

said IIES layer composed of a surface layer of said glass composition that has been ion exchanged with an acidic aqueous solution containing soluble ionic silver to diffuse silver ions into said IIES layer to render said IIES layer sensitive to high energy beams, said IIES layer comprising,

silver ions, and

water in a concentration greater than about 0.01% by weight H_2O.

4,567,105

MULTILAYER POLYCARBONATE ARTICLE

Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 13, 1984, Ser. No. 630,870

Int. Cl.[4] B32B *27/08, 27/36*

U.S. Cl. 428—412 9 Claims

1. A multilayer composition comprising an outer layer of aromatic polycarbonate, an outer layer of a polymer prepared from an olefinic monomer, said outer layers tied together with a layer comprising an admixture of an olefin acrylate polymer and poly-(4-methylpentene-1), the olefin acrylate and poly-(4-methylpentene-1) in such quantities that the adhesive strength and clarity of the tie layer is not significantly reduced after exposure to hydrolytic conditions at elevated temperatures.

4,567,106

METHOD OF FORMING A COATING ON POLYOLEFIN SUBSTRATE

Takashi Sano; Kazuo Kawabata, both of Kyoto, and Yoji Miya, Shimamotocho, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Mar. 1, 1985, Ser. No. 707,129

Claims priority, application Japan, Mar. 7, 1984, 59-44733

Int. Cl.[4] B32B *27/38;* B05D *3/02;* B32B *27/40*

U.S. Cl. 428—413 11 Claims

1. In a method of forming a coating on a polyolefin substrate comprising the steps of applying a primer coating onto the substrate and then applying a finish coating thereon, the improvement wherein said primer coating consists essentially of a polyurethane prepolymer containing a plurality of terminal free isocyanate groups derived from a polypropylene glycol having a molecular weight from about 400 to about 2,000 and an excess of diphenylmethane diisocyanate.

4,567,107

ACRYLIC RESIN HAVING PENDANT SILANE GROUPS THEREON, AND METHODS OF MAKING AND USING THE SAME

Sidky D. Rizk, Westfield; Harry W. S. Hsieh, Rahway, and Michael P. Mazzeo, Hightstown, all of N.J., assignors to Essex Specialty Products, Inc., Clifton, N.J.

Division of Ser. No. 374,989, May 5, 1982, Pat. No. 4,491,650. This application Aug. 15, 1984, Ser. No. 641,051

Int. Cl.[4] B32B *27/40;* B05D *3/02;* D05D *1/36*

U.S. Cl. 428—425.5 18 Claims

1. A method for forming a tenacious coating, resistant to weathering, on a substrate, which method comprises applying to said substrate a resinous composition comprising a poly(-meth)acrylate polymer having pendant hydrolyzable alkoxysilane groups grafted thereon, said poly(meth)acrylate polymer being a copolymer consisting essentially of one or more hydroxyalkyl acrylates or methacrylates and one or more alkyl acrylates or methacrylates, and then hydrolyzing said pendant hydrolyzable alkoxysilane groups in the presence of moisture.

4,567,108

MAGNETIC RECORDING MEDIA

August Lehner, Roedersheim-Gronau; Helmut Kopke, Weisenheim; Hermann Roller, Ludwigshafen; Werner Balz, Limburgerhof; Werner Grau, Bobenheim-Roxheim; Eberhard Koester, Frankenthal, and Friedrich Sommermann, Kehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,635

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341699

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—425.9 1 Claim

1. A magnetic recording medium which consists of a non-magnetic base which is provided with a magnetic layer consisting of finely divided anisotropic magnetic material dispersed in binders and additives, and in which the binder is a mixture based on an OH-containing polyurethane, which is crosslinked with polyisocyanates, and further physically drying binders, wherein the binder mixture consists essentially of the components

1. from 20 to 70% by weight of a high molecular weight thermoplastic linear polyurethane which has a molecular weight of from 40,000 to 150,000, is soluble in tetrahydrofuran and is prepared from

1A. 1 mole of a polyesterol having a molecular weight of from 400 to 4,000,

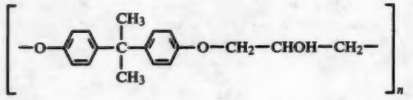
1B. from 0.3 to 15 moles of a straightchain aliphatic diol of 2 to 10 carbon atoms,

1C. from 0 to 1.5 moles of a triol of 3 to 10 carbon atoms and

1D. from 1.25 to 17 moles of diisocyanate of 6 to 30 car-

bon atoms, the amount of NCO groups being roughly equivalent to the total amount of OH groups in components 1A to 1C, with the proviso that an unpigmented film formed of component 1 has a tensile strength of from 40 to 95 N/mm^2 and an elongation at break of from 100 to 1400%,

2. from 5 to 35% by weight of a polyvinylformal binder containing not less than 65% of vinylformal groups, or of a copolymer of from 50 to 95% by weight of vinyl chloride and from 5 to 50% by weight of a mono- or diester of an aliphatic diol of 2 to 4 carbon atoms with acrylic acid or methacrylic acid, or of a phenoxy resin of the formula



where n is about 100, or of a diester and/or a triester of cellulose with one or more carboxylic acids of 1 to 4 carbon atoms, or of a copolymer of 91% of vinyl chloride base units, 3% of vinyl acetate base units and 6% of vinyl alcohol base units, and

3. from 5 to 50% by weight of a low molecular weight OH-containing polyurea-urethane which contains not less than 4 OH groups, has an OH number of from 30 to 130 and a molecular weight of from 2,000 to 30,000 and is prepared from

3.1A 1 mole of a polydiol having a molecular weight of from 400 to 4,000,

3.1B from 0.2 to 10 moles of a diol of 2 to 18 carbon atoms,

3.1C from 0.1 to 4 moles of a primary or secondary aminoalcohol of 2 to 20 carbon atoms,

3.1D from 0 to 1 mole of a triol and

3.1I from 1.20 to 13 moles of a diisocyanate of 6 to 30 carbon atoms, the amount of NCO groups of the diisocyanate being from 65 to 95%, based on components 3.1A to 3.1D, of the number of equivalents of OH and NH groups, with the provision that an unpigmented film formed from component 3 readily undergoes plastic deformation at 70° C. under superatmospheric pressure.

4,567,109

MAGNETIC RECORDING MEDIA

August Lehner, Roedersheim-Gronau; Milan Velic, Ludwigshafen; Helmut Kopke, Weisenheim; Werner Balz, Limburgerhof; Werner Lenz, Bad Durkheim; Reinhold Baur, Offenburg, and Milena Melzer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,463

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227161; Jul. 21, 1982, 3227163

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—425.9 **4 Claims**

1. A magnetic recording medium which comprises a magnetic layer which is applied to a non-magnetic base and consists essentially of a dispersion of an anisotropic magnetic material in a mixture of an OH-containing polyurethane compound, which has been finally crosslinked with a polyisocyanate, and a physical drying binder, wherein the binder mixture consists essentially of

Component 1, which is a low molecular weight OH-containing polyurea-urethane which has an OH number of from 30 to 160 and an average number molecular weight of 1,500 to 40,000 and is obtained from

1.1A 1 mole of a polydiol having a molecular weight of from 400 to 4,000,

1.1B from 0.2 to 10 moles of a diol of 2 to 18 carbon atoms,

1.1C from 0.1 to 4 moles of a primary or secondary aminoalcohol of 2 to 20 carbon atoms, and

1.1I from 1.20 to 13 moles of a diisocyanate of 6 to 30 carbon atoms, the proportion of NCO groups in the diisocyanate being from 65 to 95%, based on Components 1.1A to 1.1C, of the equivalent amount of OH and NH groups, with the proviso that the non-pigmented crosslinked film has a tensile strength greater than 15 N/mm^2, an elongation at break greater than 50%, a modulus of elasticity greater than 150 N/mm^2 and a pendulum hardness of from 30 to 140 sec,

and Component 2, which is a physically drying binder.

4,567,110

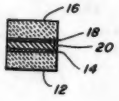
HIGH-TEMPERATURE BRAZED CERAMIC JOINTS

Philip O. Jarvinen, Amherst, N.H., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 93,576, Nov. 13, 1979, abandoned. This application Jul. 17, 1981, Ser. No. 284,583

Int. Cl.⁴ C23C *15/00*; B32B *15/04*; B23K *1/04*

U.S. Cl. 428—433 **4 Claims**



1. In the formation of a brazed ceramic joint suitable for use at temperatures over 1,000° C., the improvement of employing a metallized ceramic produced by vacuum sputtering substantially pure unalloyed nickel onto an aluminum oxide ceramic.

4,567,111

CONDUCTIVE PIGMENT-COATED SURFACES

Daniel S. Janikowski, Lake Geneva, Wis., and Ming S. Shum, Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 439,166, Nov. 4, 1982, abandoned. This application May 14, 1984, Ser. No. 609,926

Int. Cl.⁴ H01B *1/02, 1/04*

U.S. Cl. 428—457 **18 Claims**

1. A conductive, water-resistant, pigment-coated surface wherein the coating comprises an alloy of a non-noble conductive metal and at least one oxidizable material in admixture with a lead alloy.

10. A process for the preparation of a conductive water-resistant, pigment-coated surface which comprises alloying a non-noble conductive metal with at least one oxidizable material, admixing the thus-formed alloy with a lead alloy, mixing the resultant admixture with an organic vehicle to form an ink, screening said ink onto a substrate, thereafter firing said ink in an oxidizing atmosphere at a temperature in excess of about 1000° F. for a period of time sufficient to oxidize said oxidizable material with oxidation of said non-noble metal, cooling the thus-fired product, and recovering the resultant conductive water-resistant, pigment-coated surface.

4,567,112

FLEXIBLE FOIL MATERIAL OR LAMINATE, PARTICULARLY FOR SOFT PACKAGING AND CAPPING

Marcel Bernhard, Selestat, France, assignor to Societe Alsacienne d'Aluminium, Saint Julien en Genevoix, France

Filed Apr. 5, 1984, Ser. No. 597,034

Claims priority, application France, Dec. 26, 1983, 83 20758

Int. Cl.⁴ B32B *15/08, 27/32*

U.S. Cl. 428—461 **5 Claims**

1. A flexible foil material or laminate useful for soft packaging and capping comprising a layer of synthetic material disposed between two thin aluminum foils, said synthetic material

comprising amorphous polypropylene or a composition containing amorphous polypropylene wherein said composition further contains a material selected from the group consisting of a soft microcrystalline wax, a terpolymer of ethylene, acrylic acid and acrylic acid ester and mixtures thereof wherein said layer has a basic weight of between 20 and 40 g/m2.

4,567,113

HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM

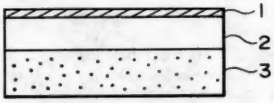
Tadatoshi Ohtsu, Hirakata, and Takashi Yamahata, Koriyama, both of Japan, assignors to General Company Limited, Osaka, Japan

Filed Sep. 6, 1984, Ser. No. 647,753

Claims priority, application Japan, Sep. 12, 1983, 58-140207[U]; Oct. 3, 1983, 58-184652; Mar. 21, 1984, 59-52416

Int. Cl.[4] B41M 5/26

U.S. Cl. 428—480 **12 Claims**



1. A heat-sensitive transferring recording medium which comprises a base film, a heat melting ink layer provided on the under surface of the base film, and a conveyance improving layer provided on the upper surface of the base film, said conveyance improving layer comprising a member selected from the group consisting of

(1) fatty acids,

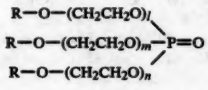
(2) fatty acid derivatives,

(3) fatty alcohols,

(4) alkali metal salts of mono- or di-alkyl phosphoric acid esters having 8–18 carbon atoms,

(5) polyester copolymers having a molecular weight of 3000 or more prepared by polycondensation of (a) an aromatic dicarboxylic acid compound or an aliphatic dicarboxylic acid compound, (b) a diol having 2–4 carbon atoms, and (c) a polyethyleneglycol compound of a molecular weight of 2000 or more,

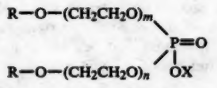
(6) tri(polyoxyethylenealkyl or alkenyl ether) phosphoric acid esters of the formula,



(I)

where R is alkyl or alkenyl of C_8–C_{25}, and l m, and n are integers of 1–10,

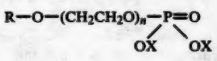
(7) phosphoric acid esters of the formula,



(II)

where R, m and n are as defined above and X is hydrogen or alkali metal,

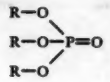
(8) phosphoric acid esters of the formula,



(III)

where R, n and X are as defined above,

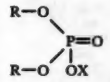
(9) phosphoric acid esters of the formula,



(IV)

where R is as defined above,

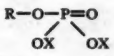
(10) phosphoric acid esters of the formula,



(V)

where R and X are as defined above, and

(11) phosphoric acid esters of the formula,



(VI)

where R and X are as defined above.

4,567,114

THERMAL DYE-TRANSFER TYPE RECORDING SHEET

Hiroyo Oshima; Isao Kano; Yutaka Kojima; Yoshihiko Shimura; Ken Ishiguro, and Koichi Nagai, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,169

Claims priority, application Japan, Apr. 30, 1982, 57-71250

Int. Cl.[4] B41M 5/26

U.S. Cl. 428—480 **10 Claims**

1. Thermal dye-transfer type recording sheet having a coating layer, the coating layer being contacted with a coloring material layer containing sublimable dye on a substrate, the coloring material being selectively transferred onto the coating layer by heating, in which the coating layer comprises as a binder saturated polyester and as a pigment a precipitated calcium carbonate of at least 25,000 cm^2/g specific-surface-area measured by a permeability method.

4,567,115

PRESSURE IMPREGNATION OF WOOD POLES FOR PRESERVATION

William P. Trumble, Kanata, Canada, assignor to Bell Canada, Montreal, Canada

Continuation-in-part of Ser. No. 450,428, Dec. 16, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 635,868

Int. Cl.[4] B27K 3/36

U.S. Cl. 428—541 **22 Claims**

1. A method of treating wood, comprising the step of exposing wood to an aqueous solution consisting essentially of water, hexavalent chromium, copper, arsenic and polyethylene glycol.

4,567,116

MAGNETIC RECORDING MEDIUM

Takeshi Sawada, Yokohama; Akira Shinmi, Kawasaki; Hiroshi Takagi, Yokohama; Kenji Suzuki; Fumio Kishi, both of Kawasaki, and Susumu Kozuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Tohoku Steel Co., Ltd., Miyagi, both of, Japan

Filed Jul. 27, 1984, Ser. No. 635,234

Claims priority, application Japan, Aug. 6, 1983, 58-144111; Aug. 6, 1983, 58-144112; Aug. 6, 1983, 58-144113

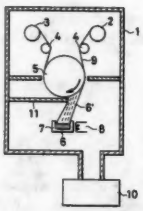
Int. Cl.[4] G11B 5/64

U.S. Cl. 428—694 **15 Claims**

1. A magnetic recording medium having a thin ferromag-

netic corrosion resistant metallic film formed by an oblique incidence deposition method, characterized in that a composition of the thin ferromagnetic metallic film is represented by the formula

$$(Fe_{1-x}Co_x)_{1-(a+b)}Ni_aX_b$$



wherein, X denotes Mn and/or Cu, x denotes a weight fraction satisfying $0<x<0.5$, a denotes a weight fraction satisfying $0.05<a<0.25$, and b denotes a weight fraction satisfying $0.01<b<0.20$.

4,567,117

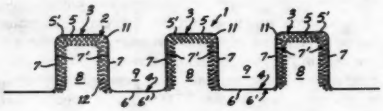
FUEL CELL EMPLOYING NON-UNIFORM CATALYST

Pinakin Patel, Danbury, Conn.; Dilip Dharia, Edison, N.J., and Hansraj Maru, Brookfield Center, Conn., assignors to Energy Research Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 396,399, Jul. 8, 1982, Pat. No. 4,467,050. This application Aug. 20, 1984, Ser. No. 642,375

Int. Cl.⁴ H01M *8/18*

U.S. Cl. 429—19 **20 Claims**



1. A fuel cell for receiving fuel having hydrocarbon content comprising:

an anode

a cathode

and means within said cell for reforming the hydrocarbon content of said fuel, said reforming means comprising: a passage in said cell, said passage having an input end for receiving said fuel and an output end; and a catalyst situated along the length of said passage between said input and output ends of endothermic reformation of said hydrocarbon content of said fuel, the amount and activity of said catalyst at points along said length being selected to promote uniform temperature distribution for said cell over said length.

4,567,118

CELL VENT

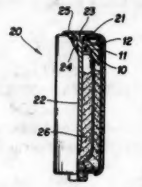
Robert L. Connelly, Pearl River, N.Y., assignor to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 512,806, Jul. 11, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 671,056

Int. Cl.⁴ H01M *2/12*

U.S. Cl. 429—53 **13 Claims**

1. An electrochemical cell comprised of a cell container having an open end thereof closed by a sealing member having an aperture therein with a metal member extending therethrough, characterized in that an extrudible material substantially surrounds the portion of said metal member within said aperture and is sealingly engaged thereto, with said extrudible material adheringly securely sealingly engaging the wall defining said aperture; wherein said metal member is heat conductive whereby heat generated within the cell is conducted, by said metal member, to said extrudible material for softening thereof; and wherein a portion of said extrudible material is



interiorily exposed to pressure within said cell, and a cross sectional area of said softened extrudible material is sufficiently large to permit said extrudible material to extrude to relieve excessive internal pressure.

4,567,119

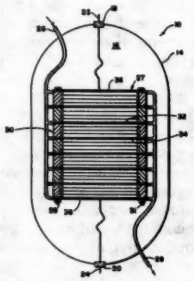
NICKEL-HYDROGEN BIPOLAR BATTERY

Hong S. Lim, Agoura, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Mar. 12, 1984, Ser. No. 588,620

Int. Cl.⁴ H01M *10/36*

U.S. Cl. 429—59 **18 Claims**



1. A bi-polar nickel-hydrogen battery comprising:

(a) a pressure vessel containing hydrogen gas; and

(b) a plurality of unit cells located within said pressure vessel, said unit cells being stacked adjacent one another for axial current flow wherein each unit cell comprises:

(1) walls defining a unit space;

(2) a hydrogen electrode located within said cell space;

(3) a nickel electrode located within said cell space having at least one opening extending therethrough to facilitate oxygen recombination by allowing oxygen gas evolved at said nickel electrode to reach said hydrogen electrode for recombination with hydrogen gas thereat to form water within said unit cell space and to prevent O_2 migration outside of the unit cell;

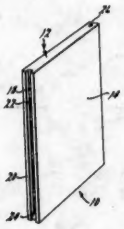
(4) a separator disposed between said nickel and hydrogen electrodes within said cell space having means for allowing oxygen gas evolved at said nickel electrode to reach said hydrogen electrode for recombination with hydrogen gas thereat and cooperating with the nickel electrode in preventing O_2 migration outside of the unit cell; and

(5) an electrolyte located in said cell space about said nickel and hydrogen electrodes and said separator to permit an electrochemical reaction between said nickel and hydrogen electrodes.

4,567,120
FLOW-THROUGH POROUS ELECTRODES

Jacob Jorne, Birmingham; Emad Roayaie, and Atul Shah, both of Detroit, all of Mich., assignors to Energy Development Associates, Inc., Greensboro, N.C.

Filed Oct. 1, 1984, Ser. No. 656,893
Int. Cl.⁴ H01M *4/00*
U.S. Cl. 429—72 **6 Claims**



1. An electrode assembly for metal-halogen pumped electrolyte battery comprising:

electrically conductive elongated bus member having generally opposing faces;

a porous unitary electrode having two generally planar opposing faces, each of which provide a reaction surface for electron-transfer reactions of the same polarity;

said electrode being generally rectangular and defining lengthwise and widthwise dimensions;

said porous electrode being connected by means of interference fit to one of said opposing faces of said bus member such that said lengthwise and widthwise dimensions are orthogonal to said bus member;

said porous electrode having first and second parallel sides extending lengthwise along said opposing faces, said first side contacting said bus member;

a channel formed along said first side and extending substantially the entire lengthwise dimension of said electrode, said channel having a barrier portion disposed in an end of said channel, said barrier portion cooperating with said bus bar to inhibit electrolyte flow through the bottom of said electrode;

a plurality of parallel passageways extending within the interior of said electrode and parallel to said widthwise dimension, said passageways communicating with said channel and terminating within the interior of said electrode and adjacent said second side;

a venting passageway extending within the interior of said electrode and parallel to said lengthwise dimension, said venting passageway communicating with said parallel passageways and adjacent said second side;

feed tube disposed at least partially within said channel for introducing electrolyte into said channel.

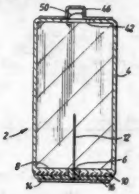
4,567,121
INSULATING SEAL FOR ELECTROCHEMICAL CELLS

Alexander Gilmour, Henley-On-Thames, England, assignor to Venture Technology Limited, Oxfordshire, England

Filed Jun. 5, 1985, Ser. No. 741,595
Claims priority, application United Kingdom, Jun. 8, 1984, 8414613
Int. Cl.⁴ H01M *2/02*
U.S. Cl. 429—181 **14 Claims**

1. An electrochemical cell including at least two electrically conductive parts which are sealed together by an organic polymer adhesive but electrically insulated from each other by a layer comprising aluminium oxide which is formed on a surface of one of the parts.

8. A method of sealing together electrically conductive parts of an electrochemical cell while retaining the said parts electrically insulated from each other, the method comprising the steps of forming a layer comprising aluminium oxide on a surface of one of the parts and adhering the parts together by

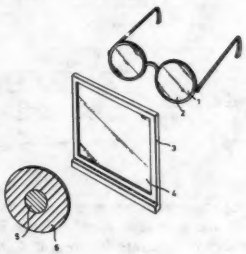


an organic polymer adhesive so that the layer electrically insulates the parts from each other.

4,567,122
PHOTOTROPIC MATERIALS

Peter J. Baldry, Surrey; John H. Collins, Essex; Daniel J. Morantz, Kent; Terence K. W. Overton, and David W. Wright, both of Essex, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Filed Jan. 6, 1983, Ser. No. 456,283
Claims priority, application United Kingdom, Jan. 15, 1982, 8201127
Int. Cl.⁴ C09K *15/00*
U.S. Cl. 430—4 **13 Claims**



1. An irreversible phototropic material comprising a matrix of a polymeric material selected from the group consisting of polyvinyl chloride and the copolymer of vinyl chloride and vinylidene chloride in which is suspended a phototropic transition metal salt and an additive wherein the additive comprises a substance which inhibits the reduction of the transition metal in the transition metal salt from a higher to a lower oxidation level and thereby inhibits the production of haze in the phototropic material.

4,567,123
DIFFUSING PLATE

Keiji Ohtaka, Tokyo; Takashi Suzuki; Kiyoshi Iizuka, both of Yokohama, and Hidemasa Mizutani, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

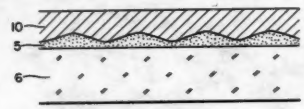
Division of Ser. No. 514,306, Jul. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 351,991, Feb. 24, 1982, abandoned. This application Jan. 25, 1985, Ser. No. 694,910
Claims priority, application Japan, Mar. 11, 1981, 56-34712
Int. Cl.⁴ G03F *7/00, 7/16;* G02B *11/00, 13/20*
U.S. Cl. 430—4 **3 Claims**

1. A method of making a diffusing plate having continuous roughness, said method comprising the steps of:

exposing a photosensitive material to image light of a mask having a regular fine pattern;

treating said photosensitive material to form regular, continuous roughness on the surface thereof;

forming a mold having said regular, continuous roughness



on the surface thereof by coating said regular, continuous roughness formed on the surface of said photosensitive material with metal; and

embossing an optical material on said metal mold.

4,567,124

ELECTROPHOTOGRAPHIC ELEMENT WITH TRISAZO PHOTOCONDUCTOR AND AN AMINE SUBSTITUTED CHARGE TRANSFER MATERIAL

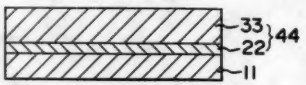
Masafumi Ohta; Masaomi Sasaki, both of Susono, and Masayuki Shoshi, Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 670,176

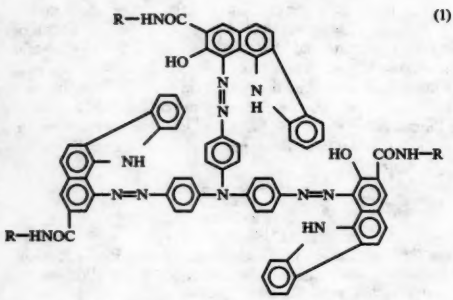
Claims priority, application Japan, Nov. 14, 1983, 58-213836

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—59 **7 Claims**

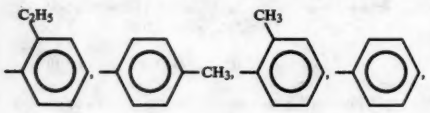


1. An electrophotographic element comprising a charge generating layer and a charge transfer layer formed on an electrically conductive substrate, wherein said charge generating layer contains a trisazo pigment having the formula (1):

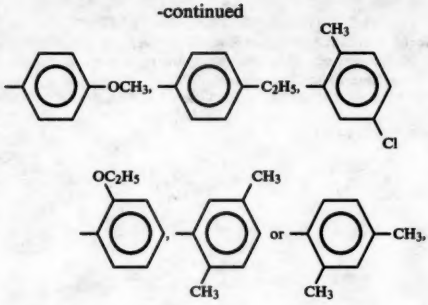


(1)

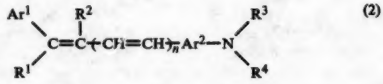
wherein R is selected from the group consisting of



-continued



and said charge transfer layer contains an α-substituted stilbene compound having the formula (2):



(2)

wherein R^1 is selected from the group consisting of substituted alkyl, unsubstituted alkyl, substituted aryl and unsubstituted aryl; R^2, R^3 and R^4 each is selected from the group consisting of hydrogen, substituted alkyl, unsubstituted alkyl, substituted aryl and unsubstituted aryl; Ar^1 is selected from the group consisting of substituted aryl and unsubstituted aryl; Ar^2 is selected from the group consisting of substituted arylene and unsubstituted arylene; or Ar^1 and R^1 are combined to form a ring; and n is 0 or 1, and a resinous binder, said charge generating layer having a thickness of from 0.01 to 5 μm and containing from 10 to 100 wt. % of said trisazo pigment, said charge transfer layer having a thickness of from 2 to 100 μm and containing from 10 to 80 wt. % of said stilbene compound.

4,567,125

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

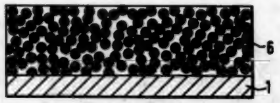
Wilko Moroni, Heidelberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,582

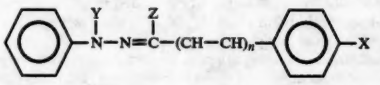
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3246036

Int. Cl.[4] G03G *5/14, 5/06*

U.S. Cl. 430—58 **11 Claims**



1. An electrophotographic recording material comprising (i) an electrically conductive support, (ii) a charge generating layer comprising a diimide of perylenetetracarboxylic acid, and (iii) a charge-transporting layer comprising a polycarbonate binder and a compound of the formula

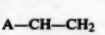


in which

x is selected from the group consisting of methyl and methoxyl,

n denotes zero or 1, and

Y and Z together denote a grouping represented by the formula



where

A is selected from the group consisting of phenyl and p-tolyl.

4,567,126

HYDRAZONE PHOTOCONDUCTIVE MATERIALS FOR ELECTROPHOTOGRAPHY

Kazuhiro Emoto, and Kozo Haino, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

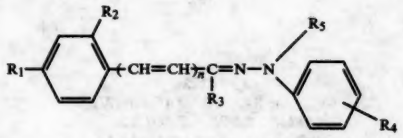
Filed Nov. 28, 1984, Ser. No. 675,743

Claims priority, application Japan, Dec. 1, 1983, 58-227172; Dec. 1, 1983, 58-227173

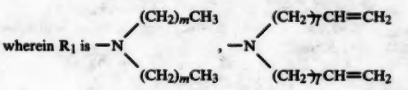
Int. Cl.⁴ G03G *5/06, 5/14*

U.S. Cl. 430—59 **16 Claims**

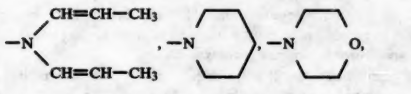
1. A photoconductive material for electrophotography comprising an electroconductive support and, formed thereon, a photoconductive layer incorporated with at least one hydrazone compound represented by the general formula (I):

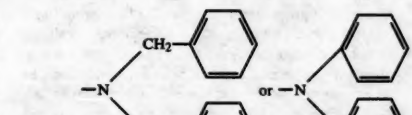


(I)



wherein R_1 is





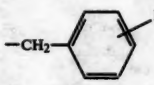
(wherein M is 0, 1, 2 or 3 and l is 1 or 2),

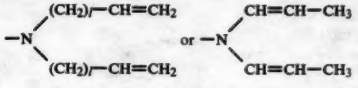
R_2 is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom,

R_3 is a hydrogen atom, a lower alkyl group or an aryl group,

R_4 is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom,

R_5 is an allyl group, propenyl group or





provided that R_1 must be

(wherein R_6 is a lower alkyl group, a lower alkoxy group or a halogen atom), and n is 0 or 1.

2. A photoconductive material for electrophotography according to claim 1, wherein the photoconductive layer contains a carrier transfer substance and a carrier generating substance and said carrier transfer substance is at least one hydrazone compound represented by the general formula (I).

13. A photoconductive material for electrophotography according to claim 2, wherein the photoconductive layer is of laminate structure comprising a carrier generating layer and a carrier transfer layer provided thereon.

4,567,127

PHOTOCONDUCTIVE MEMBER COMPRISING A HYDROGENATED OR HALOGENATED AMORPHOUS SILICON AND GERANIUM LAYER

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,539

Claims priority, application Japan, Sep. 7, 1983, 58-164581; Sep. 8, 1983, 58-165655; Sep. 21, 1983, 58-175090; Oct. 11, 1983, 58-189595; Oct. 21, 1983, 58-197334; Oct. 27, 1983, 58-201229

Int. Cl.⁴ G03G *5/08*

U.S. Cl. 430—65 **48 Claims**

1. A photoconductive member comprising a substrate and a light receiving layer haivng photoconductivity which comprises an amorphous material containing at least one of hydrogen atoms and halogen atoms, said light receiving layer further containing silicon atoms and germanium atoms, the distribution of germanium atoms therein being nonuniform in the layer thickness direction, and carbon atoms being contained in the light receiving layer; said light receiving layer exhibiting an enhanced absorption coefficient for visible light from the longer wavelength side of the spectrum.

4,567,128

COVER SHEET IN A PHOTOSENSITIVE ELEMENT

Allyn N. Bennett, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 368,126, Apr. 14, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 634,129

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—313 **16 Claims**

1. In a method of making a printed circuit board comprising the steps of:

(i) laminating a supported photosensitive layer which is photopolymerizable to a surface,

(ii) exposing imagewise the photosensitive layer to actinic radiation,

(iii) removing an area of the layer, and

(iv) modifying permanently by etching or plating a bared area of the surface;

wherein prior to step (i) the supported photosensitive layer is present in a photosensitive element comprising a flexible support bearing at least one layer of a photosensitive composition and a removable cover sheet, said support

having greater adhesion than the cover sheet to form the photosensitive element with the cover sheet being stripped from the photosensitive composition prior to laminating,

whereby the improvement comprises the cover sheet in the photosensitive element having a roughened finish on its surface which faces away from the photosensitive composition with the roughened finish having a peak to valley average distance of at least two microns.

4,567,129

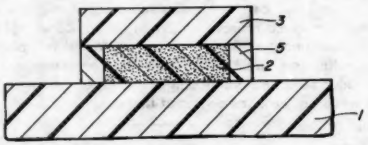
PROCESS FOR IMAGE FORMATION UTILIZING CHEMICALLY SOLUBLE PIGMENTS

Robert P. Held, Englishtown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 27, 1984, Ser. No. 635,347

Int. Cl.[4] G03C *5/16, 5/24, 5/38, 1/68*

U.S. Cl. 430—294 **11 Claims**



1. A process for the preparation of a dot-etched photopolymerizable lithographic film which comprises

(a) exposing imagewise to actinic radiation a photopolymerizable element consisting essentially of a support bearing, in order,

(1) a layer of caustic soluble photopolymerizable composition having dispersed therein a chemically soluble pigment, and

(2) a layer of clear, unpigmented caustic soluble photopolymerizable composition which is the same or different from the composition of layer (1);

(b) developing the exposed element with a caustic solution; and

(c) treating the developed image with a chemical solubilizing agent for the pigment whereby the size of the pigmented area is reduced by diffusion etching of the image without affecting the optical density of the image.

4,567,130

PROCESS FOR ETCHING SINGLE PHOTOPOLYMER LAYER UTILIZING CHEMICALLY SOLUBLE PIGMENTS

Robert P. Held, Englishtown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 27, 1984, Ser. No. 635,348

Int. Cl.[4] G03C *1/68, 5/16;* **G03F** *9/00*

U.S. Cl. 430—294 **10 Claims**

1. A process for the preparation of a dot-etched photopolymerizable lithographic film which comprises

(a) exposing imagewise to actinic radiation a photopolymerizable element consisting essentially of a support bearing a layer of a caustic soluble photopolymerizable composition having dispersed therein a chemically soluble pigment;

(b) developing the exposed element with a caustic solution to form at least one pigmented image area; and

(c) treating the developed element with a chemical solubilizing agent for the pigment whereby the size and density of the pigmented area is reduced by diffusion etching of the image.

4,567,131

LITHOGRAPHIC PRINTING PLATES

Philip J. Watkiss, Leeds, England, assignor to Vickers Plc, London, England

Filed Jul. 11, 1984, Ser. No. 629,878

Claims priority, application United Kingdom, Jul. 11, 1983, 8318686

Int. Cl.[4] G03F *7/00;* **B41M** *5/00;* **C09D** *5/20*

U.S. Cl. 430—309 **10 Claims**

9. A method of treating a lithographic printing plate having image areas of metallic silver, the method comprising applying a proteolytic enzyme and subsequently or simultaneously applying a compound capable of rendering the image areas oleophilic.

4,567,132

MULTI-LEVEL RESIST IMAGE REVERSAL LITHOGRAPHY PROCESS

Edward C. Fredericks, Haymarket; Herbert L. Greenhaus; Madan M. Nanda, both of Reston, and Giorgio G. Via, McLean, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,092

Int. Cl.[4] G03F *7/26*

U.S. Cl. 430—312 **2 Claims**

1. A single development step, dual layer photoresist photolithographic process for forming hourglass shaped photoresist structures, comprising the steps of:

depositing a first layer of positive photoresist having a base composition of a phenol-formaldehyde resin with a diazonaphthoquinone sensitizer with a first solubility characteristic of becoming soluble in an aqueous alkaline developer solution after exposure to light and post baking;

depositing a second layer of negative photoresist having said base composition plus the addition of a cross linking agent 1-hydroxyethyl-2-alkyl imidazoline on top of said first photoresist layer, having a second solubility characteristic of becoming insoluble to said developer solution after said exposure to light and said post baking;

said positive photoresist and said negative photoresist mutually intermixing at said top of said first layer forming a gradation region where the solubility in said developer gradually changes from said first characteristic in the upper portion thereof to said second characteristic in the lower portion thereof;

exposing said first and said second photoresist layers to a patterned light source;

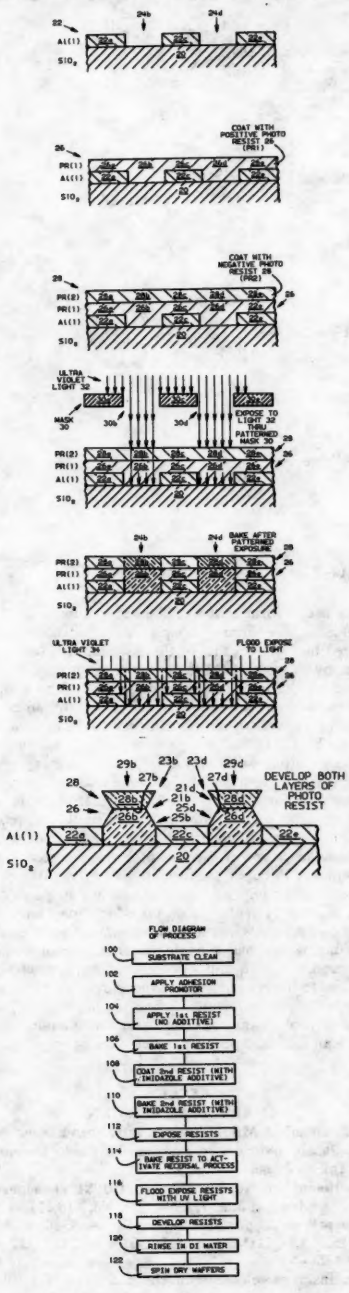
post baking said first and said second photoresist layers;

flood exposing said first and said second photoresist layers without a pattern to the flooding light;

developing said first and said second photoresist layers in said developer solution;

whereby a composite photoresist structure consisting of said

first and said second layers of photoresist will remain in those regions exposed to said patterned light source, said



structure having well-defined upper edges and a recessed contour near the interface of said first and said second photoresist layers forming an hourglass shaped photoresist structure.

4,567,133

FILM FOR THERMAL IMAGING

Russell R. Isbrandt, White Bear Township, Ramsey County, and Chung I. Young, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 520,207, Aug. 4, 1983, abandoned. This application Jun. 26, 1984, Ser. No. 622,951

Int. Cl.[4] **B05D** *3/02;* **B32B** *27/38*

U.S. Cl. 430—348 **13 Claims**

1. A film which can be imaged by thermal energy comprising:

(a) a substrate,

(b) a layer of thermally imageable material coated on at least one major surface of said substrate,

(c) an organopolysiloxane release coating, capable of releasing toner, coated over said layer of imageable material, said release coating being formed from a curable composition comprising a mixture of siloxanes consisting essentially of from 0.1 to 3% by weight of methylhydrogenpolysiloxane and from 97 to 99.9% by weight of a siloxane of the formula

$$(CH_3)_xSiO_{\frac{4-x}{2}}$$

in which x has a value from 1.9 to 2 inclusive and in which siloxane substantially all of the molecules have attached thereto at least a total of two silicon-bonded hydroxyl groups and/or alkoxy groups of less than 5 carbon atoms, a catalyst, and a cross-linking agent, said curable composition being curable at a temperature under 70° C. with a curing exposure time of under 3 minutes.

4,567,134

METHOD FOR PROCESSING OF LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shigeharu Koboshi, and Masayuki Kurematsu, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,634

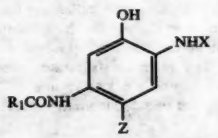
Claims priority, application Japan, Apr. 4, 1983, 58-57903

Int. Cl.[4] **G03C** *7/40, 7/16, 7/00*

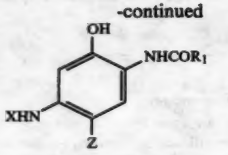
U.S. Cl. 430—372 **13 Claims**

1. A method for processing of a light-sensitive silver halide color photographic material comprising imagewise exposing and developing said light-sensitive silver halide color photographic material, said developing comprising color developing and a continuous processing method comprising fixing or bleach-fixing and a stabilizing processing step involving substantially no water washing step after fixing or bleach-fixing, wherein said light-sensitive silver halide color photographic material contains at least one of cyan couplers represented by the formula [I] or [II] shown below, and the amount of stabilizing solution supplemented is 0.1 to 30 times the amount carried over from the bath for said fixing or bleach-fixing per unit area of said light-sensitive material to be processed:

Formula (I)

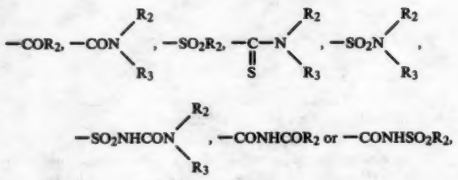


-continued



Formula (II)

wherein X represents



wherein R_2 is a substituted or unsubstituted alkyl group, alkenyl group, cycloalkyl group, aryl group or hetero ring; R_3 is a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a hetero ring; or R_2 and R_3 may be bonded together to form a 5- or 6-membered ring,

R_1 represents a ballast group and Z represents a hydrogen atom or an eliminable group through coupling with the oxidized product of an aromatic primary amine color developing agent, wherein said eliminable group represented by Z is a halogen atom; or an aryloxy group, a carbamoyloxy group, a carbamoylmethoxy group, an acyloxy group, a sulfonamide group or a succinimide group, of which oxygen atom or nitrogen atom is bonded directly to the coupling position.

4,567,135

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Jun Arakawa, and Toshiyuki Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 19, 1984, Ser. No. 572,048
Claims priority, application Japan, Jan. 19, 1983, 58-7155
Int. Cl.[4] G03C *1/46*
U.S. Cl. 430—505 **9 Claims**

1. A silver halide color photographic light-sensitive material, comprising:

a support based having thereon;

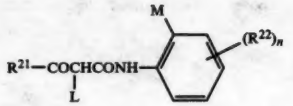
a silver halide emulsion layer;

a diffusing dye-forming coupler represented by the general formula (1):

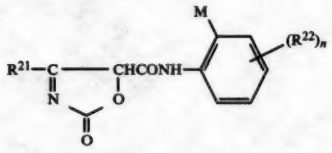
(1)

which can form a dye capable of having moderate diffusibility in an emulsion layer through coupling with an oxidation product of a color developing agent; an wherein D_p represents a diffusible coupler component which allows a dye image to exhibit controlled smearing and improved granularity; X represents a ballast group containing from 8 to 32 carbon atoms which is bound to the coupler component at the coupling position and is released through reaction with an oxidation product of a color developing agent; and a is 1 or 2; and

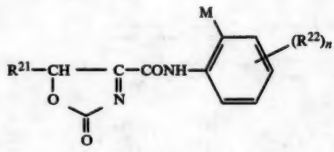
a high reaction rate coupler selected from the general formulae (CI)-(CV):



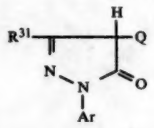
(CI)



(CII)



(CIII)



(CIV)

(CV)

which can form a dye of the same color as that of the diffusing dye-forming coupler and that has a coupling speed higher than that of the diffusing dye-forming coupler by a factor of 1.3 to

Wherein R^{21} is an alkyl group or an aryl group which may be substituted; R^{22} is a substituent which can be substituted for a hydrogen atom attached to the benzene ring of formula (CIII); and n represents 1 or 2; M represents a halogen atom, an alkoxy group or an aryloxy group; L represents a group capable of being released from coupler upon formation of a dye through oxidative coupling with an aromatic primary amine developer; R^{31} represents an amino group, an acylamino group or a ureido group; Q represents a group capable of being released from the coupler (CIV) upon the formation of a dye through oxidative coupling with an aromatic primary amine developer; Ar represents a phenyl group which may have one or more substituents; A represents an image forming coupler residue which has a naphthol or a phenol nucleus; m represents 1 or 2; and z represents a group which is attached to the coupling site of the above-described coupler residue A and is released from the coupler (CV) when a dye is formed through the oxidation coupling reaction with an aromatic primary amine developer.

4,567,136

ANALYTICAL ELEMENT

Kenichiro Okaniwa; Mikio Koyama, and Shozo Kikugawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 326,228, Dec. 1, 1981, abandoned. This application Jun. 7, 1984, Ser. No. 618,311
Claims priority, application Japan, Dec. 4, 1980, 55-171872
Int. Cl.[4] C12Q *1/00, 1/28;* G01N *21/78, 33/52*
U.S. Cl. 435—4 **26 Claims**

1. An analytical element for the detection of a substance which generates hydrogen peroxide upon reaction with an enzyme which comprises a support and a reagent layer comprising a peroxidative substance, a diffusion-resistant phenol

compound having been oil-protected, and an aromatic primary amine compound or salt thereof, said aromatic primary amine compound being capable of being oxidized to form an oxidized product, said oxidized product being capable of undergoing a coupling reaction with said diffusion-resistant phenol compound, to thereby produce a diffusion-resistant dyestuff.

4,567,137

SERUM THROMBIN TIME IN CLINICAL MEDICINE

Van B. Philpot, P.O. Box 312, East Houston, Miss. 38851

Continuation-in-part of Ser. No. 459,494, Jan. 20, 1983, Pat. No. 4,461,830. This application May 14, 1984, Ser. No. 609,817

The portion of the term of this patent subsequent to Jan. 20, 2000, has been disclaimed.

Int. Cl.⁴ G01N *33/48, 33/68, 33/86, 33/96*

U.S. Cl. 435—13 **6 Claims**

1. A method of diagnosing an abnormal body condition of a subject animal comprising the successive steps of:

(1) withdrawing a blood sample from the patient under study;

(2) allowing the sample obtained to form a clot;

(3) obtaining a sample of serum from the clot of step (2);

(4) adding a solution of purified, standardized fibrinogen to a sample of the serum of step (3) and allowing the resulting mixture to incubate and coagulate;

(5) measuring the time between the addition of the fibrinogen solution and coagulation to determine the serum thrombin time;

(6) comparing the serum thrombin time measured in step (5) with a serum thrombin time of a normal population of patients when treated under conditions similar to those of steps (1)–(5); and

(7) diagnosing an abnormal body condition of said subject in accordance with the values compared in step (6).

4,567,138

METHOD FOR DETERMINING γ-GLUTAMYLTRANSFERASE ACTIVITY AND KITS CONTAINING A NOVEL SUBSTRATE SOLUTION FOR USE THEREIN

James P. Beck, Newport Beach, and Carlos E. Luna, Placentia, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 413,042, Aug. 30, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,647

Int. Cl.⁴ C12Q *1/48*

U.S. Cl. 435—15 **20 Claims**

1. A substantially anhydrous substrate solution comprising:

(a) a substrate selected from the group consisting of salts of L-γ-glutamyl-p-nitroanilide; and

(b) a polyol selected from the group consisting of alkyl polyols containing 2 to 10 carbon atoms and 2 to 10 hydroxy groups and polyethylene glycol having an average molecular weight of from about 200 to about 600 in an amount sufficient to solubilize and stabilize said substrate.

4,567,139

CHROMOGEN FOR MEASURING THE FORMATION OF HYDROGEN PEROXIDE BASED ON 1-SUBSTITUTED-AMINOANTIPYRIN COMPOUNDS

Hans-George Batz, Tutzing, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

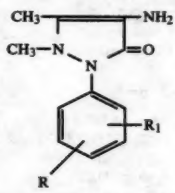
Division of Ser. No. 228,011, Jan. 23, 1981, Pat. No. 4,394,512. This application Feb. 24, 1983, Ser. No. 469,492

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004129; Oct. 7, 1980, 3039207; Jan. 31, 1981, 3100807

Int. Cl.⁴ C07D *231/46;* **C12Q** *1/28*

U.S. Cl. 435—28 **5 Claims**

1. In a method for the determination of enzymatically formed hydrogen peroxide of the type wherein phenol or other phenolic compound is oxidatively coupled with 4-aminoantipyrine as the chromogen, in the presence of peroxidase, by the action of hydrogen peroxide, to form a dye which is determined photometrically, the improvement comprising replacing the 4-aminoantipyrine with a compound of the formula



wherein R represents the group $N(R_2)_2$, in which R_2 represents an alkyl group of 1 to 3 carbon atoms or one R_2 is an acyl group of 1 to 3 carbon atoms and the other R_2 is hydrogen or an alkyl group of 1 to 3 carbon atoms, and R_1 has the same meaning as R or is a hydrogen atom or NH_2.

4,567,140

MICROBIAL POLYSACCHARIDES, PROCESS FOR THEIR PREPARATION, MICROORGANISMS SUITABLE FOR THIS AND USE OF THE POLYSACCHARIDES

Hartmut Voelskow, Hattersheim am Main, and Merten Schlingmann, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,019

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214953

Int. Cl.⁴ C12P *39/00, 19/12;* **C08B** *37/00;* **B01J** *13/00;* **C12R** *1/01, 1/38*

U.S. Cl. 435—42 **15 Claims**

1. Extracellular polysaccharides containing glucose and galactose in a molar ratio of about 4:1 to about 8:1 as the main components and about 4 to about 9% by weight of pyruvate, about 5 to about 15% by weight of succinate, about 0.5 to about 7% by weight of rhamnose and about 0.2 to about 5% by weight of mannose as subsidiary components obtained by fermentation using a mixed culture of more than one microorganism of which at least one microorganism is capable of producing a polysaccharide in pure culture.

4,567,141

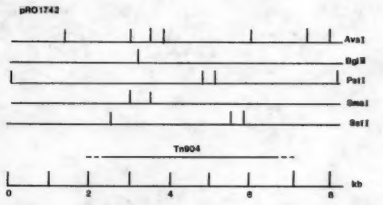
PLASMID VECTORS INCLUDING TN904

Ronald H. Olsen, Ann Arbor, Mich., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Apr. 25, 1983, Ser. No. 488,036

Int. Cl.⁴ C12P *19/34;* **C12N** *15/00, 1/00*

U.S. Cl. 435—91 **25 Claims**



1. In a method including transposing a transposon by mating bacterial cells wherein the first cell contains the transposon in a first plasmid and the second cell contains a second plasmid which is receptive to the transposon the improvement which comprises:

(a) transposing transposon Tn904 in a first plasmid PLASMID-1::Tn904 to a second vector plasmid receptive to the

transposon to form a second transconjugant plasmid VECTOR PLASMID-2::Tn904, wherein Tn904 encodes for streptomycin resistance in a site cleaved by AvaI, wherein the second vector plasmid is selected from a Pseudomonas or Escherichia vector plasmids and wherein the VECTOR PLASMID-2::Tn904 is transformable; and

(b) cleaving the Tn904 with AvaI and ligating a segment of DNA into the cleaved site to produce a recombinant plasmid.

4,567,142

PROCESS FOR ISOMERIZING GLUCOSE

Norman E. Lloyd, Ridgefield, Conn., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 393,845, Jun. 30, 1982, Pat. No. 4,411,996. This application Oct. 24, 1983, Ser. No. 544,894 The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.

Int. Cl.⁴ C12P *19/24*

U.S. Cl. 435—94 **40 Claims**

1. A process for isomerizing glucose to fructose which comprises contacting a glucose-containing feed liquor with chemically stabilized glucose isomerase at a temperature of from about 90° C. to about 140° C. at a pH of from about 3 to about 8, an actual contact time sufficient to attain a final content in said liquor of at least about 53 to about 60 weight percent of fructose based on the total carbohydrate content while controlling the degradation time at a value equal to less than the value calculated with the formula.

$$t_d = a \log (4300/T+273) - pH - 3.23) \quad (1)$$

in which T is the reaction temperature in ° C.; pH is the pH of the reaction mixture; and t_d is the degradation time in minutes; to preclude substantial formation of psicose and/or other non-fructose, non-glucose sugars.

4,567,143

PROCESS FOR PREPARING 4'-DESCHLOROREBECCAMYCIN

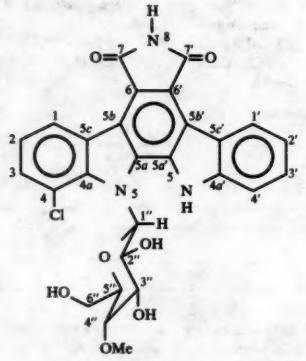
James A. Matson, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 646,673, Sep. 4, 1984, Pat. No. 4,524,145. This application Mar. 18, 1985, Ser. No. 690,271

Int. Cl.⁴ C12P *17/18;* C12R *1/365*

U.S. Cl. 435—119 **1 Claim**

1. a process for producing 4'-deschlororebeccamycin having the formula



which comprises cultivating a *Nocardia aerocolonigenes* ATCC 39243 or a 4'-deschlororebeccamycin-producing mutant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of 4'-deschlororebeccamycin is produced by said organism in said culture medium and then isolating said 4'-deschlororebeccamycin from the culture medium in a substantially pure form.

4,567,144

METHOD OF PRODUCING LONG CHAIN WAX ESTERS FROM ETHANOL

Saul L. Neidleman, Oakland, and Jacqueline L. Ervin, Pinole, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Aug. 16, 1982, Ser. No. 408,254

Int. Cl.⁴ C12P *7/64;* C12R *1/265*

U.S. Cl. 435—134 **6 Claims**

1. A process for producing a mixture of wax esters having the general formula RCO_2R', where R and R' are each radicals selected from the group consisting of:

I. $CH_3(CH_2)_aCH{=}CH(CH_2)_b{-}$, where a+b=12–14 for R and 13–15 for R', and

II. $CH_3(CH_2)_c{-}$, where c=14–16 for R and 15–17 for R',

said process comprising

aerobically incubating a culture of microorganisms of the genus Acinetobacter in an aqueous mineral salts solution containing ethanol as a primary food source, and

extracting the wax esters mixture produced by said incubating.

4,567,145

CONTINUOUS PRODUCTION OF ETHANOL BY USE OF RESPIRATION DEFICIENT MUTANT YEAST

Marcel Faber, Princeton, N.J.; Jerome D. Bernstein, New Hope, Pa., and Matthew Grossman, Piscataway, N.J., assignors to HRI, Inc., Gibbsboro, N.J.

Filed Nov. 15, 1982, Ser. No. 441,474

Int. Cl.⁴ C12P *7/06;* C12N *1/16*

U.S. Cl. 435—161 **18 Claims**

1. A continuous process for producing ethanol from D-sugars, comprising:

(a) inoculating a fermentation zone with a respiration-deficient mutant of a flocculating strain of *Saccharomyces uvarum;*

(b) feeding a mixture of a D-sugar, a nitrogen source, a vitamin source and a mineral source into said fermentation zone in the presence of an oxygen-containing gas;

(c) fermenting said D-sugar mixture for a sufficiently long period of time to yield an ethanol product; and

(d) separating said ethanol product as overflow from the mutant yeast cells.

16. A respiration deficient mutant of *Saccharomyces uvarum* strain ATCC 26602 for producing ethanol from D-sugar.

4,567,146

SYNTHETIC PLASMID AND BACTERIA CONTAINING IT

Nicholas J. Brewin, Cringleford, and Andrew W. B. Johnston, Little Melton, both of England, assignors to National Research Development Corporation, London

Filed Nov. 5, 1981, Ser. No. 318,417

Int. Cl.⁴ C12N *15/00, 1/20, 1/00;* C12P *13/00;* C12R *1/41*

U.S. Cl. 435—172.3 **14 Claims**

2. A method of preparing a culture of bacteria of the genus Rhizobium, which method is characterized in that

(1) in a first cross, a donor strain of Rhizobium, containing (a) a Rhizobium plasmid lacking genes coding for nodulation but which is transmissible, is crossed with a recipient strain of Rhizobium, carrying (b) a Rhizobium plasmid having Rhizobium genes coding for nodulation, nitrogen fixation and hydrogen uptake ability but which is non-transmissible, whereby a transconjugant strain carrying a plasmid which is formed from said plasmids (a) and (b) and is a conjugal precursor of a recombinant plasmid (c)

having genes coding for nodulation, nitrogen fixation and hydrogen uptake ability and being transmissible is obtained;

(2) said transconjugant strain is separated from donor and recipient strains and cultured to produce a substantially pure culture thereof;

(3) in a second cross, the transconjugant strain from the first cross is used as a donor strain and crossed with a plasmid-containing recipient strain whereby a transconjugant strain carrying a recombinant plasmid (c) is obtained; and

(4) said transconjugant strain from the second cross is separated from donor and recipient strains and cultured to produce a substantially pure culture thereof.

7. A method of imparting hydrogen uptake ability to bacteria of the genus Rhizobium, which method is characterized in that (1) a strain of *Rhizobium leguminosarum* NCIB 11684 or NCIB 11682, as a donor strain, is crossed with a recipient strain of *Rhizobium leguminosarum* to produce a kanamycin-resistant transconjugant strain, said recipient strain being one which permits selection of the transconjugant strain against the donor and recipient strains and which allows the transconjugant strain to be selected against when used as a donor in a subsequent cross with another strain of *Rhizobium leguminosarum*, (2) said transconjugant strain is separated from the donor and recipient strains and cultured to produce a substantially pure culture thereof; (3) in a second cross the transconjugant strain obtained from the first cross is used as a donor strain and crossed with a recipient strain of *Rhizobium leguminosarum* to produce a kanamycin-resistant transconjugant strain and (4) said transconjugant strain from the second cross is separated from the donor and recipient strains to produce a biologically pure culture thereof.

4,567,147

ATTENUATED SMALLPOX VACCINE STRAIN

Kiyoshi Ooi, Tokyo; Michio Morita, Chiba; Kazuyoshi Suzuki, Ichikawa; Soh Hashizume, Chiba, and Hanako Yoshizawa, Funabashi, all of Japan, assignors to Chiba Prefectural Government, Chiba, Japan

Filed Dec. 20, 1984, Ser. No. 683,867

Claims priority, application Japan, Mar. 28, 1984, 59-58502

Int. Cl.⁴ C12N *7/08;* A61K *39/285*

U.S. Cl. 435—237 **1 Claim**

1. An attenuated smallpox vaccine strain exhibiting no invasiveness caused by peripheral infection on the central nervous system of a mouse and little post-vaccinal side effects, which is prepared by subculturing a Lister strain of vaccinia virus in rabbit kidney cells over 36 generations at 30° C., plaque-purifying the strain thrice to isolate 50 clones, selecting a temperature-sensitive variant showing worst growth in Vero cells at 40° C. from said 50 clones, subculturing the temperature sensitive variant in rabbit kidney cells over six generations, plaque-purifying the variant twice to isolate a clone showing relatively small and uniform pocks on the chorioallantoic membrane of an embryonated egg, subculturing the clone in rabbit kidney cells over three generations at 30° C. and isolating a clone showing very small pocks on the chorioallantoic membrane of an embryonated egg.

4,567,148

METHOD FOR QUANTITATIVELY DETERMINING THE AMOUNT OF HEMOGLOBIN IN A BIOLOGICAL SAMPLE

Samuel Schwartz, St. Louis Park, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 190,399, Sep. 24, 1980, Pat. No. 4,378,971. This application Sep. 13, 1982, Ser. No. 418,282

Int. Cl.⁴ G01N *33/72*

U.S. Cl. 436—66 **22 Claims**

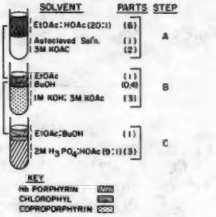
1. A method of quantitatively determining the amount of hemoglobin in a biological material comprising the steps of:

preparing a test sample of said biological material;

converting the hemoglobin in said test sample to hemoglobin derived porphyrins;

performing an extraction procedure for the purpose of separating the hemoglobin derived porphyrins from various contaminants in said test sample including mixing said test sample with a first extraction reagent comprising an organic solvent effective to separate the hemoglobin derived porphyrins from iron;

allowing said test sample and first extraction reagent mixture to separate into an aqueous phase containing iron and a supernatant containing hemoglobin-derived porphyrins;



mixing said supernatant with a second extraction reagent comprising an alkaline solvent containing a soluble salt effective to separate the hemoglobin derived porphyrins from naturally occurring porphyrins;

allowing said supernatant and second extraction reagent mixture to separate into a phase containing naturally occurring porphyrins and a second supernatant containing hemoglobin derived porphyrins; and

determining the amount of hemoglobin derived porphyrins.

4,567,149

BINDING ASSAY SYSTEM AND METHOD OF MAKING AND USING SAME

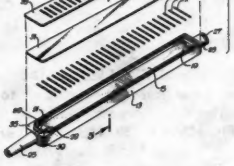
William J. Sell, San Francisco; David H. Riege, Newark, and Vincent A. Marinkovich, Palo Alto, all of Calif., assignors to Mast Immunosystems, Ltd., Mountain View, Calif.

Filed Mar. 17, 1983, Ser. No. 476,367

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.⁴ G01N *33/053, 23/06;* C12M *1/00;* C01N *33/544*

U.S. Cl. 436—513 **17 Claims**



12. Apparatus for use in a system for the allergy screening of a liquid specimen through binding assays, the apparatus comprising:

a rigid plastic body having an elongated, shallow well formed therein, and a substantially flat land surrounding the well;

a plurality of cotton threads stretched tautly across the elongated well from the land on its opposite sides, the threads being oriented in spaced parallel relationship substantially perpendicular to the longitudinal axis of the elongated well and disposed for contacting the liquid

specimen, each thread coated with a different allergen or group of allergens for binding corresponding antibodies in the liquid specimen;

a substantially flat cover plate secured to the land of the rigid body, to enclose the elongated well, the cover plate including

a thin, transparent plastic sheet overlaying to the land of the rigid body, and

a thin metallic sheet overlaying the plastic sheet and having a plurality of elongated apertures aligned with each of the plurality of cotton threads; and

means defining a port at each end of the elongated elongated well, to facilitate insertion and removal of a liquid specimen in the well, for contact with the plurality of cotton threads.

4,567,150

METHOD FOR DETERMINING TRANSFERRIN AND COMPOSITION THEREFOR

Alessandro Tabacco, Siena; Paolo Tarli, Monteriggioni, and Paolo Neri, Siena, all of Italy, assignors to Sclavo, S.p.A., Siena, Italy

Continuation of Ser. No. 323,360, Nov. 20, 1981, abandoned.
This application Jan. 18, 1984, Ser. No. 571,859
Int. Cl.[4] G01N *33/90*
U.S. Cl. 436—87 7 Claims

1. A method for determining transferrin comprising the steps of adding to the sample being tested a reagent comprising a solution of a ferric salt adsorbed on an aqueous suspension buffered to a pH of between 8 and 9 of a solid substrate selected from the group consisting of basic magnesium carbonate and calcium carbonate, centrifuging the mixture thus obtained, and measuring the iron bonded by transferrin in the supernatant liquor.

4,567,151

BINDER GLASS OF Bi_2O_3-SiO_2-GeO_2 -(PBO OPTIONAL) ADMIXED WITH ZNO/ZNO AND Bi_2O_3

Barry E. Taylor, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 639,384, Aug. 10, 1984, Pat. No. 4,532,075.
This application Jan. 14, 1985, Ser. No. 690,885
Int. Cl.[4] C03C *3/04, 3/12*
U.S. Cl. 501—15 3 Claims

1. A glass having a composition corresponding to the formula $Bi_4Si_{3-x}Ge_xO_{12}$, wherein x=0.1-2.9 having dissolved therein 0-100 pph by wt. PbO, basis glass.

4,567,152

CO-MATRIXED ZEOLITE AND P/ALUMINA

Lloyd A. Pine, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 13, 1984, Ser. No. 681,450
Int. Cl.[4] B01J *29/06*
U.S. Cl. 502—64 10 Claims

1. A catalyst comprising: (a) a crystalline metallosilicate zeolite; (b) a non-zeolitic inorganic oxide matrix, said zeolite being dispersed in said matrix and (c) discrete particles of phosphorus-containing alumina also dispersed in said matrix, said discrete particles having been prepared by contacting alumina having a BET surface area greater than 50 square meters per gram with a phosphorus compound selected from the group consisting of phosphoric acid, a salt of phosphoric acid, phosphorous acid, a salt of phosphorous acid, and mixtures thereof, for a time sufficient to incorporate an effective amount of phosphorus in said alumina.

4,567,153

POLYMERIZATION CATALYST COMPRISING COPULVERIZED SOLID MAGNESIUM COMPOUND AND SOLID HALIDE OF SCANDIUM

Victoria Graves, Crosby, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 13, 1984, Ser. No. 639,879
Int. Cl.[4] C08F *4/72, 4/64*
U.S. Cl. 502—113 21 Claims

1. A supported olefin polymerization catalyst prepared under anhydrous conditions by the steps of:

(a) mechanically copulverizing a solid magnesium compound and solid halide of scandium to form a solid copulverized product,

(b) treating said copulverized product with one or more compounds of a transition metal of Group 4b or 5b of the Periodic Table of Elements, and

(c) recovering solid catalyst.

8. The supported olefin polymerization catalyst according to claim 1 wherein said transition metal compound comprises a titanium compound and a vanadium compound.

4,567,154

MIXED METAL ALKYL CATALYST FOR OLEFIN POLYMERIZATION

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 27, 1983, Ser. No. 508,435
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—114 10 Claims

1. A catalyst composition for use in polymerizing alpha olefins which comprises a solid supported titanium tetrahalide complex and a cocatalyst comprising a mixture of an alkyl aluminum halide and an alkyl lithium compound.

4,567,155

OLEFIN POLYMERIZATION CATALYST SYSTEM PRODUCING POLYMER WITH LOW ACTIVE CHLORIDE

Benjamin S. Tovrog; Charles R. Hoppin, both of Naperville, and Bryce V. Johnson, Elburn, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 24, 1984, Ser. No. 653,211
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—123 19 Claims

1. A catalyst system suitable for gas-phase polymerization of alpha-olefins to polymers containing essentially no active chloride comprising:

A. a titanium-containing component supported on a hydrocarbon-insoluble magnesium-containing compound in combination with an electron donor compound; and

B. a co-catalyst comprising (a) at least one trialkyl aluminum compound, (b) an aromatic acid ester, and (c) an unhindered secondary amine, such secondary amine having no more than one methyl group on a carbon atom adjacent to a nitrogen atom, optionally reacted with a dialkylaluminum hydride, in substantial absence of compounds containing an Al—Cl bond.

4,567,156

OIL SOLUBLE CHROMIUM CATALYST

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

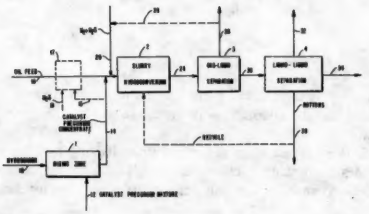
Filed Apr. 29, 1985, Ser. No. 728,485
Int. Cl.[4] B01J *31/12;* C10G *47/06*
U.S. Cl. 502—173 11 Claims

1. A catalyst prepared by the steps which comprise:

(a) adding a water soluble aliphatic polyhydroxy compound to an aqueous solution of chromic acid (CrO_3);

(b) forming a mixture of a hydrocarbon material and at least a portion of the mixture resulting from step (a); and

(c) heating the mixture resulting from step (b) in the presence of a hydrogen sulfide-containing gas at conditions to



produce a slurry comprising said hydrocarbon material and a solid chromium-containing catalyst.

4,567,157

PRODUCTION OF PHENOLS AND CATALYST THEREFOR

Chiu T. Lam, Sewell, N.J., and David M. Shannon, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1982, Ser. No. 379,229

Int. Cl.⁴ B01J *27/14;* **C01B** *15/16;* **C07C** *37/00*

U.S. Cl. 502—208 **5 Claims**

1. A multicomponent catalyst consisting essentially of copper, phosphorus present in the form of phosphate, and a metal selected from the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel and zinc.

4,567,158

PROCESS FOR PREPARING PHOSPHORUS-VANADIUM MIXED OXIDE OXIDATION CATALYSTS

James T. Wrobleski, St. Louis; James W. Edwards, Creve Coeur; Charles R. Graham, St. Charles; Robert A. Keppel, St. Louis, and Harold Raffelson, Olivette, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,361

Int. Cl.⁴ B01J *27/14;* **C07D** *307/34*

U.S. Cl. 502—209 **66 Claims**

1. A process for the preparation of a phosphorus-vanadium mixed oxide oxidation catalyst for the production of maleic anhydride wherein the catalyst exhibits a weight/weight productivity to maleic anhydride of at least 70 g MAN/kg cat.-hr based upon a performance test conducted at a concentration of 1.5 mole percent hydrocarbon-in-air, a space velocity of 1450 hr^{-1} under a pressure of 1.055×10^2 kPa-G, and a temperature sufficient to maintain the hydrocarbon conversion within the range of 70 mole percent to 90 mole percent, which process comprises:

(a) introducing a substantially pentavalent vanadium-containing compound into an alcohol medium capable of reducing the vanadium to a valence state less than +5 to form a slurry;

(b) contacting the slurry with an effective amount of alcohol-modifying agent;

(c) effecting the reduction of at least a portion of the vanadium to a valence state of +4;

(d) adding a pentavalent phosphorus-containing compound to the vanadium-containing mixture before or after effecting the reduction to form a phosphorus-vanadium mixed oxide catalyst precursor;

(e) recovering the phosphorus-vanadium mixed oxide catalyst precursor;

(f) drying the catalyst precursor; and

(g) calcining the catalyst precursor at a temperature from about 250° C. to about 600° C.

4,567,159

OLEFIN METATHESIS CATALYST

Robert L. Banks, and Simon G. Kukes, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 536,819, Sep. 28, 1983, Pat. No. 4,504,694. This application Sep. 11, 1984, Ser. No. 649,341

Int. Cl.⁴ B01J *31/02, 27/14, 27/02, 27/06*

U.S. Cl. 502—219 **10 Claims**

1. A process for preparing a disproportionation catalyst comprising forming a catalytically effective amount of calcined composite comprising at least one metal oxide selected from molybdenum oxide and tungsten oxide and an inorganic refractory material, contacting the calcined composite with a promoting amount of at least one treating agent selected from chlorinated silicon compounds comprising monosilanes selected from the group consisting of monomethyl-Tri-chlorosilane, isobutyltrichorosilane, dimethyldichlorosilane, trimethyl monochlorosilane, n-decyldichlorosilane, trichloromethyltrichlorosilane, 4-methylphenyltrichlorsilane, monochloromethyltrichlorosilane, cyclohexyldichlorosilane, siloxanes, and polysilanes, thionyl chloride, and sulfuryl chloride, and subjecting same to conditions suitable for said treating agent to promote the activity of said molybdenum and tungsten oxides for the disproportionation of olefins.

4,567,160

CATALYST COMPOSITION FOR THE PRODUCTION OF ALCOHOLS FROM SYNTHESIS GAS

Barry Nay, Woking, and David G. Stewart, Epsom, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Jul. 5, 1983, Ser. No. 510,882

Claims priority, application United Kingdom, Jul. 9, 1982, 8220083

Int. Cl.⁴ B01J *23/58, 23/72, 23/89*

U.S. Cl. 502—326 **3 Claims**

1. A catalyst composition suitable for use in a process for the production of alcohols from synthesis gas which composition consists essentially of:

(a) cobalt,

(b) one or more of copper, silver, gallium, zirconium, zinc and thorium,

(c) one or more of palladium, platinum and nickel, and

(d) one or more alkali metals, in the atomic ratio of component (a): component (b); component (c) of 100:1 to 400:1 to 500, the alkali metal or metals forming up to 5% by weight of the composition and wherein said essential elements are present in the form of their oxides or in the form of salts which are decomposable by heat to oxides.

4,567,161

LIQUID ACTIVE INGREDIENT CONCENTRATES FOR PREPARATION OF MICROEMULSIONS

Ulrich Posanski, Freiburg; Miklos Ghyczy, Cologne; Kurt-Heinz Bauer, Freiburg, and Armin Wendel, Cologne, all of Fed. Rep. of Germany, assignors to A. Natterman & Cie GmbH, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,664

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225706

Int. Cl.⁴ A61K *31/70, 31/685*

U.S. Cl. 514—23 **9 Claims**

1. Liquid formulations which contain a component or mixture of components selected from the group consisting of one or more pharmaceutically active substance, said component being insoluble or poorly soluble in water, and conventional additives and auxiliary substances in a lipophilic liquid or in a liquid mixture with a phospholipid selected from the group consisting of phosphatidyl choline, phosphatidyl ethanol amine, phosphatidic acid, phosphatidyl inositol, N-acylphosphatidyl ethanol amine and mixtures thereof, and an ethoxyl-

ated derivative of glycerin ester, with fatty acids as co-emulsifier, wherein the lipophilic liquid contains a lipophilic carrier liquid and the first or second OH groups of the glycerin or the glycerin ester are esterized by means of the fatty acids with hydrocarbon chains of from 8 to 16 C atoms and the third of remaining OH group of the glycerin body is etherized with the polyethyleneglycol with 6-30 ethyleneoxide units, the molar ratio of phospholipid to co-emulsifier being from 1:1 to 1:4.

4,567,162

BIOLOGICALLY ACTIVE HEPTAPEPTIDES

Roberto de Castiglione, Milan; Giuseppe Perseo, Desio; Mauro Gigli, and Barbara Hecht, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

Filed Jun. 26, 1984, Ser. No. 624,820

Claims priority, application United Kingdom, Jul. 13, 1983, 8319174

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—16 **23 Claims**

1. A peptide of the formula:

ti X-Val-Pro-Pro-Leu-Gly-Trp-A-Y

wherein

X is selected from the group consisting of a hydrogen atom or a terminal nitrogen protecting group selected from the group consisting of acyl, aliphatic urethane, aromatic urethane, alkyl, and aralkyl groups;

A is a neutral L-α-amino acid residue selected from the group consisting of Met, Nle, Leu and Phe; and

Y is selected from the group consisting of a hydroxy group, an amino group or a group of the formula OR, NHR, NR_2 or NH—NH—R′ wherein

(i) R represents a straight alkyl chain, a branched alkyl chain, a cyclic alkyl group, a fused alkyl ring, or a bridged alkyl ring, each having up to 11 carbon atoms and being unsubstituted or independently substituted by a hydroxy or an amino group or a halogen atom, or R represents an aralkyl group having from 7 to 14 carbon atoms or a phenyl group; and

(ii) R′ represents a hydrogen atom, a straight alkyl chain, a branched alkyl chain, a cyclic alkyl group, a fused alkyl ring, or a bridged alkyl ring, each having up to 11 carbon atoms and being unsubstituted or independently substituted by a hydroxy or an amino group or a halogen atom, or R′ represents an aralkyl group having from 7 to 14 carbon atoms or a phenyl group, or R′ represents a straight chain aliphatic acyl group, a branched chain aliphatic acyl group, or a cyclic aliphatic acyl group, each having from 1 to 11 carbon atoms and being unsubstituted or independently substituted by a hydroxy or an amino group or a halogen atom, an aromatic acyl group which is unsubstituted or independently substituted by a hydroxy or amino group or a halogen atom, a straight chain, a branched chain or a cyclic aliphatic urethane type group having from 3 to 11 carbon atoms, or an aromatic urethane group,

or a pharmaceutically or veterinarily acceptable salt thereof.

4,567,163

SALICYCLIC ACID DERIVATIVES OF N-ACETYLCYSTEINE AND PHARMACOLOGICAL USE THEREOF

Osvaldo Ponchiroli, Milan, Italy, assignor to Pietro Ismardi & C. S.p.A., Oneglia, Italy

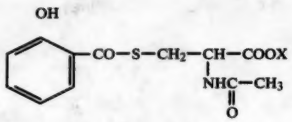
Filed Nov. 16, 1982, Ser. No. 442,044

Claims priority, application Italy, Nov. 20, 1981, 25198 A

Int. Cl.[4] A61K *31/265, 31/71, 31/65;* **C07C** *153/023*

U.S. Cl. 514—29 **9 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen, alkali metals, alkaline earth metals, and the radicals of organic bases.

7. A pharmaceutical composition having anti-pyretic, anti-inflammatory, analgesic and mucolytic activity, comprising an effective amount for said activity of the compound of claim 1.

4,567,164

PHARMACEUTICAL COMPOSITION FOR TREATING PROTOZOAN DISEASE CONTAINING AT LEAST ONE TETROCARCIN

Kenjiro Shimada; Masao Otomo, both of Tsuchiura; Fusao Tomita, Machida, and Shingo Ito, Tsuchiura, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,695

Claims priority, application Japan, Mar. 4, 1983, 58-35563

Int. Cl.[4] A61K *31/71*

U.S. Cl. 514—33 **5 Claims**

1. A method for treating piroplasma disease in mammals which comprises administering an effective amount of a pharmaceutical composition comprising at least one member selected from the group consisting of tetrocarcins A, B and C, alkali metals salts thereof, and alkaline earth metal salts thereof; and at least one pharmaceutical carrier useful for preparation of injection, powder, tablet, granular, capsule, suppository, suspension or emulsion.

4,567,165

N-METHANESULFONIC ACID DERIVATIVES OF 3-DEMETHOXYISTAMYCIN B

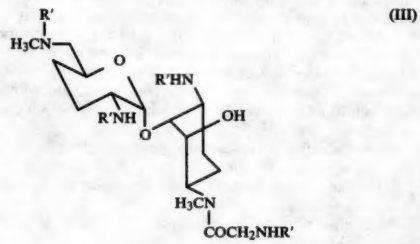
Hamao Umezawa, Tokyo, and Shinichi Kondo, Yokohama, both of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Filed May 8, 1984, Ser. No. 608,213

Int. Cl.[4] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 514—36 **7 Claims**

1. An N-methanesulfonic acid derivative of 3-demethoxyistamycin B represented by the formula



(III)

wherein one, two, three or four of the R′ groups denote(s) each a group —$CHRSO_3M$ and the remaining other R′ group(s) denote(s) each a hydrogen atom, where R is a hydrogen atom, an alkyl group, a phenyl group, and M is a hydrogen atom, an ammonium cation, an alkali metal atom or an alkaline earth metal atom.

7. An antibacterial pharmaceutical composition comprising an antibacterially effective amount of a derivative according to claim 1, in combination with a pharmaceutically acceptable carrier therefor.

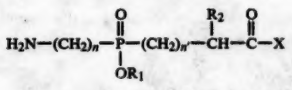
4,567,166

AMINO AND SUBSTITUTED AMINO PHOSPHINYLALKANOYL COMPOUNDS USEFUL FOR TREATING HYPERTENSION

Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

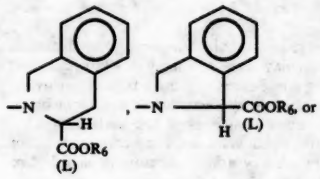
Division of Ser. No. 398,052, Jul. 14, 1982, Pat. No. 4,444,765. This application Mar. 19, 1984, Ser. No. 591,290
Int. Cl.[4] A61K 31/675; C07F 9/60, 9/65
U.S. Cl. 514—82 12 Claims

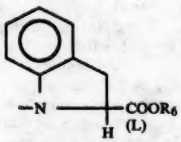
1. A compound of the formula



wherein

X is an imino acid of the formula



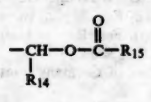


n is an integer of from 4 to 8;

n' is zero or one;

R_2 is hydrogen, lower alkyl, halo substituted lower alkyl, benzyl or phenethyl;

R_1 and R_6 are independently selected from hydrogen, lower alkyl, benzyl, benzhydryl, or



wherein

R_{14} is hydrogen, lower alkyl, cycloalkyl or phenyl, and

R_{15} is hydrogen, lower alkyl, lower alkoxy, phenyl, or

R_{14} and R_{15} taken together are $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH=CH-$, or

and when either or both of R_1 and R_6 are hydrogen a basic addition salt or an amino acid addition salt thereof.

11. A pharmaceutical composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of one or more compounds of claim 1 or pharmaceutically acceptable salts thereof.

12. The method of treating hypertension in a mammalian specie comprising administering an effective amount of the composition of claim 11.

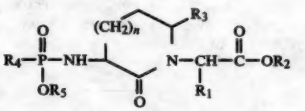
4,567,167

CERTAIN 3-PHOSPHINYL-2-OXO-PIPERIDINE-1-ACETIC ACID DERIVATIVES HAVING ANTI-HYPERTENSIVE ACTIVITY

Donald S. Karanewsky, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 479,429, Mar. 28, 1983, Pat. No. 4,533,661. This application Nov. 28, 1984, Ser. No. 676,137
Int. Cl.[4] C07F 9/65; A61K 31/445
U.S. Cl. 514—89 7 Claims

1. A compound of the formula

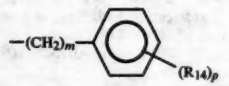


wherein

R_1 is hydrogen, lower alkyl, amino substituted lower alkyl, hydroxy substituted lower alkyl, or halo substituted lower alkyl;

n is 1;

R_3 is hydrogen, lower alkyl, $-(CH_2)_m$-cycloalkyl, or

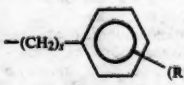


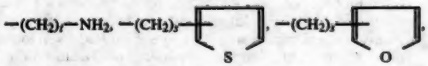
m is zero or an integer from 1 to 4;

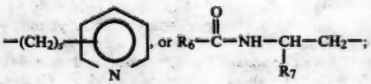
R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, trifluoromethyl, or hydroxy;

p is an integer from 1 to 3 provided that p is more than one only if R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_4 is alkyl of 1 to 10 carbons,



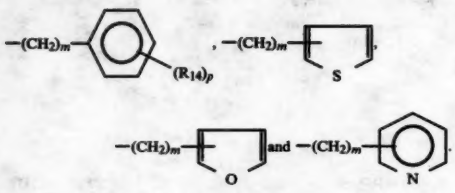




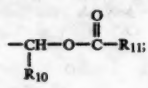
s is zero or an integer from 1 to 7;

t is an integer from 1 to 8;

R_6 and R_7 are independently selected from the group consisting of lower alkyl, halo substituted lower alkyl, $-(CH_2)_m$-cycloalkyl,



R_5 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, physiologically acceptable salt forming ion, and



R_{10} is hydrogen, lower alkyl, cycloalkyl, or phenyl; and R_{11} is hydrogen, lower alkyl, lower alkoxy, cycloalkyl, phenyl, benzyl, or phenethyl.

4,567,168

CYANOHYDRIN PHOSPHONATES AS PESTICIDES

Bernd-Wieland Krüger; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

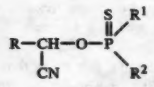
Filed Jan. 28, 1982, Ser. No. 344,268

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106475; Nov. 12, 1981, 3145009

Int. Cl.[4] C07F 9/40; A01N 57/02

U.S. Cl. 514—89 **11 Claims**

1. A cyanohydrin phosphonate of the formula



in which

R is a hydrogen atom, an alkyl radical which is optionally substituted by halogen, C_1 to C_4 alkoxy, C_1 to C_4 alkylthio or C_1–C_4-alkylamino and which has 1 to 20 carbon atoms, an optionally halogen-substituted C_2 to C_5 alkenyl or C_2 to C_5 alkynyl radical, a C_3 to C_8 cycloalkyl radical which is optionally substituted by C_1 to C_4 alkyl, C_2 to C_4 alkoxycarbonyl, phenoxybenzyloxycarbonyl and/or halogen, a phenyl-C_1 or C_2 alkyl radical which is optionally substituted by halogen, optionally halogen-substituted C_1 to C_4 alkyl or optionally halogen-substituted C_1 to C_4 alkoxy, a phenyl radical which is optionally substituted by halogen, nitro, C_1 to C_4 alkyl, optionally halogen substituted C_1 to C_4 alkoxy, optionally halogen-substituted C_1 to C_4 alkylthio, trifluoromethyl and/or by optionally halogen substituted C_1 or C_2 alkylenedioxy, or a furyl, thienyl or pyridyl radical,

R^1 is an optionally halogen-substituted radical selected from C_1 to C_5 alkoxy, phenoxy, benzyloxy, C_1 to C_5 alkylthio, C_3 to C_5 alkenylthio, C_3 to C_5 alkynylthio, phenylthio, benzylthio and C_1 to C_5 alkylamino (monoalkylamino or dialkylamino), and

R^2 is an optionally halogen-or C_1 to C_4 alkylthio-substituted radical selected from C_1 to C_5 alkyl and phenyl

10. A method of combating pests comprising applying to the pests, or to a habitat thereof, a pesticidally effective amount of a compound according to claim 1.

4,567,169

NITROSOUREA SUBSTITUTED PHOSPHONATES AND PHARMACEUTICAL USE

Gilbert Lavielle, Orleans, and Claude Cudennec, La Celle Saint Cloud, both of France, assignors to ADIR, s.a.r.l., Neuilly-sur-Seine, France

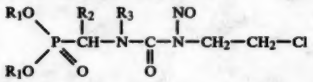
Filed Nov. 2, 1983, Ser. No. 547,881

Claims priority, application France, Nov. 17, 1982, 82 19199

Int. Cl.[4] A61K 31/66, 31/675; C07F 9/40, 9/58

U.S. Cl. 514—089 **7 Claims**

1. Nitrosourea compound corresponding to the formula I



(I)

in which

R_1 represents hydrogen, alkyl having 1 to 6 carbon atoms or phenyl,

R_2 represents hydrogen, alkyl containing 1 to 6 carbon atoms, and which may carry a carboxy or alkoxycarbonyl radical including 2 to 6 carbon atoms; a thienyl, phenyl or benzyl radical which may carry a halogen atom or an alkyl or alkoxy radical containing 1 to 5 carbon atoms;

R_3 represents hydrogen, alkyl having 1 to 6 carbon atoms; or benzyl which may carry a halogen atom or an alkyl or alkoxy radical having 1 to 5 carbon atoms; or, alternatively,

R_2 and R_3 together represent a group $—(CH_2)_m—$ in which m has the value 3 or 4, in racemic form or in the form of optical isomers.

7. A method for treating a living animal body afflicted with a tumor responsive to such treatment, comprising the step of administering to the said living animal body having said tumor an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,567,170

3-CHLORO-3-PHENYLPROP-2-ENYL THIOPHOSPHATES AND THEIR USE FOR CONTROLLING PESTS

Annegrit Baumann, Mannheim; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

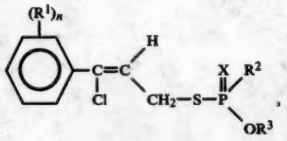
Filed Nov. 8, 1983, Ser. No. 550,025

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242281

Int. Cl.[4] C07F 9/165; A01N 57/14

U.S. Cl. 514—128 **3 Claims**

1. A thiophosphate of the formula



I

where R^1 is hydrogen, or not more than 4 identical or different substituents R^1 may be present, each of which is fluorine, chlorine or bromine, straight-chain or branched alkyl of not more than 5 carbon atoms, alkoxy of not more than 3 carbon atoms or alkylthio of not more than 3 carbon atoms, R^2 is alkoxy, alkylthio or alkylamino, each of which is substituted by straight-chain or branched alkyl of not more than 5 carbon

atoms, R^3 is alkyl of not more than 3 carbon atoms and X is oxygen or sulfur.

3. A process for combatting pests, wherein an effective amount of 3-chloro-3-phenylprop-2-enylthiophosphate of the formula I as defined in claim 1 is allowed to act on the pests and/or their habitat.

4,567,171

STABLE, CONCENTRATED, LIQUID DISPERSIONS OF ANIONIC DYESTUFFS

Thomas M. Mangum, Bayville, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 487,343, Apr. 21, 1983, abandoned. This application Mar. 20, 1984, Ser. No. 590,234

Int. Cl.[4] D06P *1/90*

U.S. Cl. 514—150 6 Claims

1. A stable dyestuff composition which is a water solution of an anionic dye, containing a nonionic dispersing agent, and having dispersed therein undissolved particles of the dye which are 10μ or less in diameter, wherein the composition consists essentially of about 40% to about 80% by weight of water, about 15% to about 40% by weight of the dye and about 1% to about 25% by weight of the dispersing agent.

4,567,172

6α-METHYLPREDNISOLONE DERIVATIVES

Yoshiaki Kamano, Tempe, Ariz.; Saburo Sugai, Saitama, Japan; Tokuji Okazaki, Tokyo, Japan; Seiichiro Yoshida, Tokyo, Japan, and Sanya Akaboshi, Tokyo, Japan, assignors to Ohta Seiyaku Kabushiki Kaisha, Tokyo, Japan

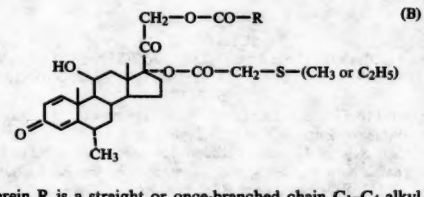
Filed May 27, 1983, Ser. No. 498,636

Claims priority, application Japan, May 31, 1982, 57-91389; Jul. 2, 1982, 57-114011; Apr. 15, 1983, 58-66872

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—179 12 Claims

1. A 6α-methylprednisolone derivative which is a 21-acyloxy-11β-hydroxy-6α-methyl-17α- methyl- or -ethyl-thioacetoxy-1,4-pregnadiene-3,20-dione compound of the formula:



(B)

wherein R is a straight or once-branched chain C_1–C_4 alkyl group or a C_1–C_4 alkoxy- or alkylthio-methyl group.

4,567,173

PYRIDINE, 2,2'-(2-IMIDAZOLIDINYLIDENE)DI-, COPPER IRC ' AND NICKEL COMPLEXES AND USE IN ANIMALS

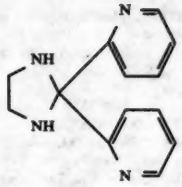
Kurt G. R. Sundelin, Modesto, Calif., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Apr. 1, 1982, Ser. No. 364,555

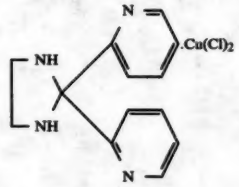
Int. Cl.[4] C07F *15/02, 15/04, 1/08;* A61K *31/555*

U.S. Cl. 514—188 7 Claims

1. The reaction product of ethylene diamine and 2,2'-dipyridylketone said product being a compound of the formula



3. The compound



7. An animal feed additive comprising a compound of claim 5, claim 6, claim 2 or claim 1 in an amount effective to enhance feed efficiency.

4,567,174

BIS(1-SUBSTITUTED BIGUANIDE) DERIVATIVES

Philip N. Edwards, Bramhall, and Michael S. Large, Congleton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 7, 1984, Ser. No. 607,703

Int. Cl.[4] C07D *403/12;* A61K *31/445;* A01N *43/40*

U.S. Cl. 514—210 8 Claims

1. A bis(1-substituted biguanide) derivative of the formula V:

$$R^3R^4N.C(:NR^5)NH.C(:NR^9)NR^1—X—NR^2.C(:NR^9)NH.C(:NR^6)—NR^7R^8$$

or a tautomeric form thereof, wherein R^1, R^2 and R^9, which may be the same or different, are each hydrogen, a 1–16C alkyl radical, a 3–16C cycloalkyl radical, a (3–12C cycloalkyl)(1–4C alkyl) radical, a phenyl or naphthyl radical, a phenyl(1–4C) alkyl or naphthyl(1–4C)alkyl radical or a diphenylmethyl radical, wherein said phenyl or naphthyl radical, said phenyl (1–4C) alkyl or naphthyl(1–4C)alkyl radical, or said diphenylmethyl radical may each include optional substituents selected from halogen atoms, amino, carbamoyl, cyano, hydroxy, nitro and trifluoromethyl radicals, 1–6C alkyl, alkoxy, alkanoyl, alkylamino and alkanoylamino radicals and 2–6C alkoxy-carbonyl and dialkylamino radicals, provided that at least one of R^1, R^2 and R^9 is other than hydrogen; R^3, R^4, R^7 and R^8, which may be the same or different, are each hydrogen, or an alkyl, cycloalkyl, (cycloalkyl)alkyl, phenyl, naphthyl, phenylalkyl, naphthylalkyl, or diphenylmethyl radical as defined above, or a 2–16C alkoxyalkyl radical, or R^3, R^4 and the nitrogen atom to which they are attached, or R^7 and R^8 and the nitrogen atom to which they are attached, which may the same or different, are each a 1-azetidinyl, 1-pyrrolidinyl, piperidino, hexamethyleneimino, heptamethyleneimino, morpholino or 4-(1–8C alkanoyl)-1-piperazinyl radical, each of which may bear 1–3C alkyl substituents; R^5 and R^6, which may be the same or different, are each hydrogen or a 1–8C alkyl radical; and X is a 2–16C linking group which is a straight chain alkylene radical, or a straight chain alkylene radical bearing one or more 1–16C alkyl substituents, of which any pair or pairs which are attached to different carbon atoms, may be joined so as to form, together with the intervening carbon atom or atoms

of the alkylene radical a (5–7C)-cycloalkyl radical or radicals; and the acid addition salts thereof.

6. An antibacterial or antifungal composition comprising an effective antibacterial or antifungal amount of a compound as claimed in claim 1 and an inert diluent or carrier therefor.

4,567,175

8-CHLORO-1,5-BENZOTHIAZEPINE DERIVATIVES

Mikio Takeda, Urawa; Tokuro Oh-ishi, Tokyo; Hiromichi Nakajima, Urawa, and Taku Nagao, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed May 16, 1984, Ser. No. 610,856

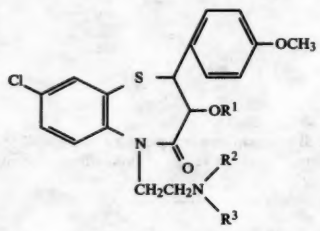
Claims priority, application United Kingdom, Jun. 3, 1983, 8315364; Jan. 14, 1984, 8400983

Int. Cl.⁴ C07D *281/10;* A61K *31/55*

U.S. Cl. 514—211 **20 Claims**

1. A compound of the formula:

(I)



wherein R^1 is hydrogen, lower alkyl or a group of the formula: R^4CO—, each of R^2 and R^3 is lower alkyl and R^4 is lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

15. A method of producing a hypotensive effect on a warm-blooded animal comprising administering to said warm-blooded animal an effective amount of the compound claimed in claims 1, 3, 6, 7, or 10 or.

4,567,176

4H-IMIDAZOL-4-ONES AND THEIR PHARMACEUTICAL USE

Thomas H. Brown, Tewin, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Apr. 18, 1984, Ser. No. 601,527

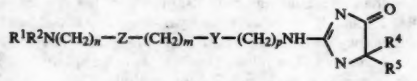
Claims priority, application United Kingdom, Apr. 27, 1983, 8311443

Int. Cl.⁴ A61K *31/55;* C07D *401/12*

U.S. Cl. 514—212 **24 Claims**

1. A compound of the formula (I):

(I)



or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2 are independently hydrogen, C_{1-6}alkyl, phenyl(C_{1-6})alkyl, furanyl(C_{1-6})alkyl, thienyl(C_{1-6}) alkyl, C_{3-10}cycloalkyl, hydroxy(C_{2-6}) alkyl or halo(C_{2-6})alkyl (wherein said hydroxy and halo groups are not substituted on the carbon atom adjacent to the nitrogen atom); or

R^1 and R^2 together represent —$(CH_2)_q$— wherein q is 4 to 7 to form together with the nitrogen atom to which they are attached a 5–8 membered saturated ring;

n is an integer from 1 to 6;

Z is 2,5-furanyl, 2,5-thienyl, 2,4-pyridyl wherein the $R^1R^2N(CH_2)_n$ group is in the 4-position, or 1,3- or 1,4-phenylene;

m is one; or if Z is pyridyl or phenylene m may also be zero;

Y is oxygen, sulphur or methylene;

p is two, three of four;

R_3 is hydrogen, or C_{1-6}alkyl optionally substituted by phenyl, hydroxy or C_{1-6}alkoxy (wherein said hydroxy and C_{1-6}alkoxy groups are not substituted on the carbon atom adjacent to the ring nitrogen atom); and

R^4 and R^5 are independently hydrogen, C_{1-6}alkyl optionally substituted by phenyl, or phenyl.

24. A method of blocking histamine H_2-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,567,177

IMIDAZOLINE DERIVATIVES AS α_2-ANTAGONISTS

Dennis Bigg, Jouy en Josas; Claude Morel, Magny-les-Hameaux, and Mireille Sevrin, Paris, all of France, assignors to Synthelabo, Paris, France

Filed Oct. 16, 1984, Ser. No. 661,483

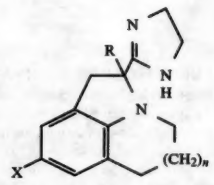
Claims priority, application France, Oct. 17, 1983, 83 16474; Feb. 9, 1984, 84 01997; Jun. 4, 1984, 84 08726

Int. Cl.⁴ A61K *31/55, 31/47;* C07D *471/06, 487/06*

U.S. Cl. 514—214 **4 Claims**

1. An imidazoline derivative, in the form of an enantiomer or a mixture thereof, of the formula (I)

(I)



in which n is 1 or 2, R is hydrogen, C_1–C_3 alkyl or allyl, and X is hydrogen, halogen, methyl or methoxy, or a pharmaceutically acceptable acid addition salts thereof.

2. A pharmaceutical composition for treating depression comprising an anti-depressant effective amount of an imidazoline derivative or salt as claimed in claim 1 and

a pharmaceutically acceptable diluent therefor.

4,567,178

SUBSTITUTED 5,11-DIHYDRO-6H-DIBENZ[B,E]AZEPIN-6-ONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Wolfgang Eberlein, Biberach; Günter Trummlitz, Warthausen; Wolfhard Engel; Günther Schmidt, both of Biberach, all of Fed. Rep. of Germany; Rüdolf Hammer, and Antonio Giachetti, both of Milan, Italy, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 689,325

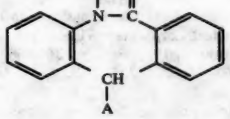
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402060

Int. Cl.⁴ A61K *31/55;* C07D *403/12, 403/14*

U.S. Cl. 514—215 **6 Claims**

1. A compound of the formula

(I)



wherein

A represents a (1-methyl-4-piperidinyl)-acetyl, (4-methyl-1-piperazinyl)-acetyl, or [(1-methyl-4-piperidinyl)-amino]-carbonyl group,

or an entantiomer or pharmacologically acceptable addition salt thereof with an inorganic or organic acid.

6. A process for treating a gastrointestinal tract condition in a warm-blooded host in need of such treatment which comprises administering to said host an effective amount of a compound of claim 1.

4,567,179

ANTIINFLAMMATORY SALTS OF PIROXICAM

Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed Oct. 11, 1984, Ser. No. 659,733
Int. Cl.[4] C07D *279/02, 417/02;* A61K *31/54*
U.S. Cl. 514—225 12 Claims

1. A 1:1 doxepin salt of piroxicam.

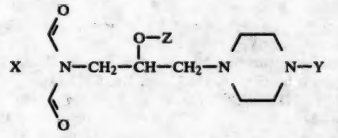
4,567,180

CARBOXIMIDE DERIVATIVE AND MEDICINES CONTAINING SAME

Noriyasu Hirose, Tokyo; Shigeru Souda; Kazutoshi Miyake, both of Ibaraki; Shizuo Kuriyama, Saitama; Kazuyasu Usuki; Yasuhiro Akiyama, both of Tokyo; Naoko Nagaoka, and Hidetoshi Kawashima, both of Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

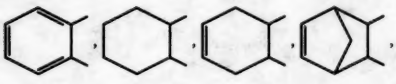
Filed Nov. 22, 1983, Ser. No. 555,211
Claims priority, application Japan, Nov. 25, 1982, 57-205545
Int. Cl.[4] A61K *31/505, 31/495;* C07D *403/14, 403/06*
U.S. Cl. 514—253 38 Claims

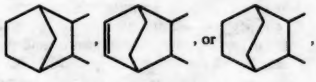
38. A method for treating diabetes which comprises administering to a patient suffering from diabetes a therapeutically effective amount of a carboximide of the formula:



wherein

X is





Z is (1) alkyl of 1–10 carbon atoms, (2) benzyl in which the phenyl moiety is unsubstituted or is substituted by a halogen atom, (3) cyclohexyl, (4) cyclohexylmethyl, (5) allyl or (6) cinnamyl, and

Y is pyridyl, pyrimidyl or phenyl, said groups being unsubstituted or substituted by at least one member selected from the group consisting of halogen and methyl,

or a pharmaceutically acceptable acid addition salt thereof.

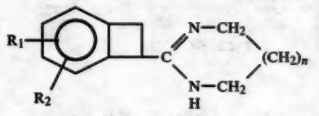
4,567,181

BICYCLO (4.2.0) 1,3,5-OCTATRIENE COMPOUNDS AND USE AS α-ADRENERGICS

Charles Malen, Fresnes; Jean-Louis Peglion, Chatou; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures s/Yvette, all of France, assignors to ADIR, s.a.r.l., Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 570,529, Jan. 13, 1984, abandoned. This application Apr. 5, 1984, Ser. No. 596,932
Int. Cl.[4] A61K *31/505, 31/415;* C07D *239/02, 233/04*
U.S. Cl. 514—256 8 Claims

1. A bicyclo[4.2.0]1,3,5-octatriene selected from those corresponding to the formula:



I

in which:

R_1 and R_2 each represent hydrogen, halogen, alkyl and alkoxy, each having from 1 to 4 carbon atoms inclusive, sulphonamide possibly substituted by an alkyl having from 1 to 4 carbon atoms inclusive; or together represent methylenedioxy,

n is 0 or 1,

in racemic form or as an optical isomer thereof,

or an addition salt thereof with a pharmaceutically acceptable acid.

4. A method for treating a living animal body afflicted with a condition which is related to adrenoreceptor activity, which comprises the step of administering to the said living animal an amount of a compound of claim 1, which is effective for the alleviation of the said condition.

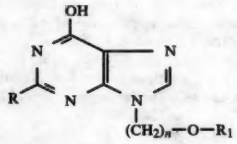
4,567,182

COMPOUNDS ENDOWED WITH IMMUNOMODULATING ACTIVITY

Paolo C. Ferraris, Genoa, Italy, assignor to Co Pharma Corporation s.r.l., Genoa, Italy

Filed Sep. 14, 1982, Ser. No. 418,189
Claims priority, application Italy, Sep. 24, 1981, 24120 A/81; Aug. 13, 1982, 22848 A/82
Int. Cl.[4] A61K *31/52;* C07D *473/30*
U.S. Cl. 514—262 14 Claims

1. A compound of formula I



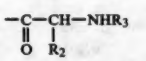
(I)

wherein:

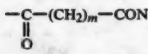
R is hydrogen or NH_2;

n is an integer from 1 to 6;

R_1 is a chain of formula

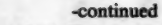


(a)



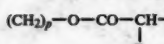
(b)

-continued

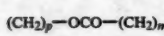


(c)

when n = 1, a chain of formula (d)



(e)



(f)

wherein

R_2 is the radical attached to the α-carbon atom of an α-aminoacid of formula

said aminoacid being glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, glutamic acid, arginine, lysine, cysteine, cystine, methionine, phenylalanine, tyrosine, tryptophan, proline or histidine;

R_3 is hydrogen; pI m and p are integers ranging independently from 2 to 6,

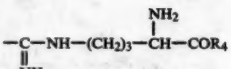
A is a group of formula

wherein

R_2 is as indicated hereinabove,

R_4 is OH or

A is a group of formula



wherein

R_4 is as indicated hereinabove.

4,567,183

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING XANTHINES AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Continuation-in-part of Ser. No. 474,358, Mar. 11, 1983, Pat. No. 4,486,436, which is a continuation of Ser. No. 400,597, Jul. 22, 1982, Pat. No. 4,420,483. This application Dec. 12, 1983, Ser. No. 560,460

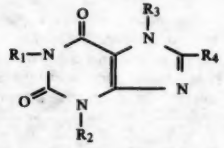
Int. Cl.[4] A61K *31/19, 31/52*

U.S. Cl. 514—264 **75 Claims**

1. A method of eliciting an onset hastened and enhanced analgesic and anti-inflammatory response in a mammalian organism in need of such treatment, comprising administering to such organism:

(i) an analgesically and anti-inflammatorily effective amount of benoxaprofen, flurbiprofen, fenbufen, ketoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen, bucloxic acid, or pharmaceutically acceptable salts thereof, and

(ii) an amount of xanthine derivative sufficient to hasten the onset of and enhance the analgesic and anti-inflammatory response of component (i), said xanthine derivative having the formula:

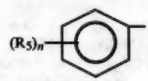


(I)

or a pharmaceutically acceptable non-toxic salt thereof wherein

R_1–R_3, inclusive, independently represent hydrogen, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl, C_3–C_6cycloalkyl, hydroxy (C_1–C_6)alkyl, halogen, hydroxy(C_1–C_4)alkylamino(C_1–C_4)alkyl, C_1–C_4(dialkyl)amino(C_1–C_4)alkyl, C_1–C_4alkylcarbonyl(C_1–C_4)alkyl, C_1–C_6alkylamino, C_1–C_6(dialkyl)amino, indolyl, phenyl or allyl:

R_4 is hydrogen, C_1–C_6alkyl, halo(C_1–C_6)alkyl, C_1–C_6alkylamino, C_1–C_6alkylthio, nitro, carboxy C_1–C_6(dialkyl)amino, C_3–C_6cycloalkyl, phenyl, naphthyl, ar(C_1–C_4)alkyl, or a group of the formula



(II)

where R_5 is halo, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6alkylthio, nitro or C_1–C_6alkylamino, and n is 1, 2 or 3 with the proviso that R_1, R_2 and R_3 cannot all be C_1alkyl when R_4 is hydrogen.

4,567,184

CERTAIN ARYL OR HETERO-ARYL DERIVATIVES OF 1-HYDROXY-PENTANE OR 1-HYDROXY-HEXANE WHICH ARE USEFUL FOR TREATING INFLAMMATION AND ALLERGIES

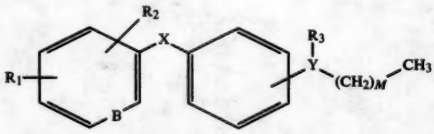
John H. Musser, Malvern, Pa., and Utpal R. Chakraborty, Orangeburg, N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Continuation-in-part of Ser. No. 445,876, Dec. 1, 1982. This application Sep. 9, 1983, Ser. No. 530,811

Int. Cl.[4] C07D *213/30, 215/14;* **A61K** *31/44, 31/47*

U.S. Cl. 514—277 **16 Claims**

1. A compound of the formula:



and pharmaceutically acceptable salts thereof, wherein

R_1 and R_2 are each independently H, an alkyl group having from 1 to about 6 carbon atoms, and one of the terms R_1 and R_2 may comprise CF_3; COOH; COO-lower alkyl or R_1 and R_2 combine with the six-membered ring to which they are attached to form naphthyl; quinoline or isoquinoline;

B is C or N;

X is CH_2O

Y is $CHCH_2$ or $C(R_5)CH_2$ wherein R_5 is H or lower alkyl;

R_3 is OH;

M is an integer from about 2 to about 3.

16. A method of treating inflammatory and allergic condi-

tions in a mammal by administering to said mammal an effective amount of a compound of claim 1.

4,567,185

ENDORPHIN BLOCKAGE

Marvin A. Sackner, Miami Beach, Fla., assignor to Key Pharmaceuticals, Inc., Miami Beach, Fla.

Continuation-in-part of Ser. No. 494,228, May 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 480,439, Mar. 30, 1983, abandoned. This application Sep. 29, 1983, Ser. No. 537,182

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 5 Claims

1. A method of permitting restful sleep at high altitudes comprising administering to a patient susceptible to Cheyne-Stokes respiration at said high altitudes a pharmaceutically acceptable amount of 6-methylene-6-desoxy-N-cyclopropylmethyl-14-hydroxydihydronormorphone which is capable of blocking the action of endogenous endorphins, whereby sleep interruptions characteristic of Cheyne-Stokes respiration are alleviated.

4,567,186

5-HETERYL-1,6-NAPHTHYRIDIN-2(1H)-ONES, CARDIOTONIC USE THEREOF AND INTERMEDIATES THEREFOR

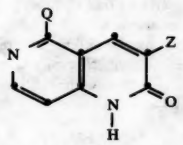
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,802

Int. Cl.[4] A61K *31/435;* C07D *471/04, 213/24*

U.S. Cl. 514—300 21 Claims

1. 3-Z-5-Q-1,6-naphthyridin-2(1H)-one having the formula I



I

or acid-addition or cationic salt thereof, where Z is hydrogen, cyano or carboxy, and Q is 2(or 3)-furanyl, 2(or 3)-thienyl, 4(or 3)-pyridinyl or 4(or 3)-pyridinyl having one or two methyl substituents.

17. A method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically effective amount of 3-Z-5-Q-1,6-naphthyridin-2(1H)-one of claim 1 or pharmaceutically acceptable acid-addition or cationic salt thereof, where Z is hydrogen or cyano, and Q is 2(or 3)-furanyl, 2(or 3)-thienyl, 4(or 3)-pyridinyl or 4(or 3)-pyridinyl having one or two methyl substituents.

4,567,187

CARBOSTYRIL DERIVATIVES AND ANTIHISTAMINIC AGENTS CONTAINING THE CARBOSTYRIL DERIVATIVES

Kazuo Banno; Takafumi Fujioka; Masaaki Osaki, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

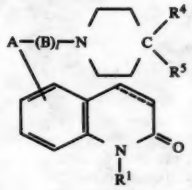
Division of Ser. No. 240,306, Mar. 4, 1981, abandoned. This application Apr. 7, 1982, Ser. No. 366,336

Claims priority, application Japan, Mar. 6, 1980, 55-28805; Aug. 20, 1980, 55-115022

Int. Cl.[4] A61K *31/47;* C07D *215/22*

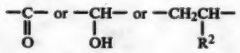
U.S. Cl. 514—312 21 Claims

1. A carbostyril derivative or a pharmaceutically acceptable salt thereof, wherein said carbostyril derivative is represented by thereof, wherein said carbostyril derivative is represented by the general formula (1),

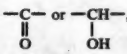


(1)

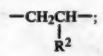
wherein R^1 is a hydrogen atom, a lower alkyl group, a phenyl-lower alkyl group, a lower alkenyl group or a lower alkynyl group; A is a group of the formula,



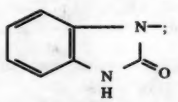
(wherein R^2 is a hydrogen atom or a lower alkyl group); B is a lower alkylene group; l is 1 when A is a group of the formula



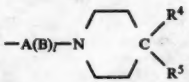
or l is 0 or 1 when A is a group of the formula



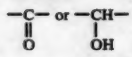
R^4 is an unsubstituted or substituted-phenyl group having 1 to 3 substituents, on the phenyl ring, selected from the group consisting of a halogen atom, a lower alkyl group and a lower alkoxy group; or R^4 is a substituted-phenyl group having a lower alkylene-dioxy group as the substituent, on the phenyl ring, a phenyl-lower alkyl group, 1,2,3,4-tetrahydronaphthyl group or a group of the formula,



R^5 is a hydrogen atom, a hydroxy group or a lower alkanoyl group; the carbon-carbon bond between the 3- and 4-positions in the piperidine ring of formula (1) may be a double bond, in which case R^5 does not exist; the carbon-carbon bond between the 3- and 4-positions in the carbostyril skeleton is a single or double bond; provided that (a) when R^1 is a hydrogen atom, (b) when the substituted position of a group of the formula



is at the 6-position in the carbostyril skeleton (A is a group of the formula



B is a group of the formula

(wherein R is a hydrogen atom or a lower-alkyl group); R^4 is a phenyl-lower alkyl group or an unsubstituted phenyl group) and (c) when the carbon-carbon bond between the 3- and 4-positions in the carbostyril skeleton is a single bond, then R^5 should not be a hydrogen atom.

21. A pharmaceutical composition comprising an antihistaminic agent containing an effective amount of at least one carbostyril derivative represented by the general formula (1) of claim **1**, or a pharmaceutically acceptable salt thereof, as the active ingredient.

4,567,188

HYPOTENSIVE 2-NITRO-1,1-ETHENEDIAMINES

Ekkehard Niemers; Andreas Knorr, both of Wuppertal, and Bernward Garthoff, Hilden, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

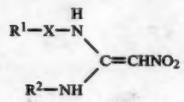
Filed Aug. 10, 1983, Ser. No. 522,069

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232462

Int. Cl.[4] **C07D** *213/74;* **C07C** *87/60;* **A61K** *31/44, 31/135*

U.S. Cl. 514—332 **10 Claims**

1. A compound of the formula



in which

R^1 is aryl with 6 to 10 carbon atoms optionally substituted up to three times by halogen, lower alkyl, lower alkoxy, trifluoromethyl, methylmercapto, nitro and/or cyano or is pyridyl optionally substituted by lower alkyl or halogen,

R^2 is alkyl with 1 to 10 carbon atoms optionally substituted by lower alkoxy or independently is any of the radicals of R^1, and

X is methylene radical optionally substituted by lower alkyl, or a direct bond but if X is a direct bond R^2 is not aryl,

or a physiologically acceptable acid addition salt thereof.

7. A composition for treating acute and chronic ischemic heart disease, for reducing high blood pressure or for treating disorders in cerebral and peripheral blood flow in which a hypotensive agent would be useful, comprising an amount effective therefor of a compound or salt according to claim **1** in admixture with a pharmaceutically acceptable diluent.

4,567,189

IMIDAZOLE DERIVATIVES USED IN ANTITHROMBOTIC METHOD

Peter J. Fellner, Marlow; Mun F. Lai, Maidenhead, and Thakorbhai P. Patel, High Wycombe, all of England, assignors to G. D. Searle & Co., Skokie, Ill.

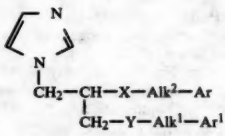
Continuation of Ser. No. 363,180, Mar. 29, 1982, abandoned. This application May 3, 1984, Ser. No. 606,808

Claims priority, application United Kingdom, Apr. 13, 1981, 8111614

Int. Cl.[4] **A61K** *31/415, 31/44*

U.S. Cl. 514—338 **1 Claim**

1. A method of treating a patient suffering from or liable to suffer from a thrombotic condition which comprises administering to said patient an effective amount of a compound of the formula:



I

and acid addition salts therefore;

wherein Ar and Ar^1, independently represent an aromatic radical which may be substituted with one or more substituents selected from the class comprising:

halogen;
lower alkyl;
lower alkoxy;
alkylenedioxy;
aralkoxy;
argyloxy;
trihalomethyl;
carboxy;
carboxyalkyl;
cyano;
carboxamido;
di-lower alkylamino;
nitro; and
lower alkyl sulphonyl

provided that either Ar or Ar^1 is an aromatic radical having at least one substituent selected from the class comprising alkoxy, alkylenedioxy, carboxy or carboxyalkyl; and

wherein Alk^1 and Alk^2, independently represent an alkylene group containing from 1 to 8 carbon atoms which may be substituted one or more times by lower alkyl; X and Y which may be the same or different represent O, NH or S; and in which the imidazole ring may be substituted by one or more lower alkyl substituents.

4,567,190

PESTICIDAL PHENYLHYDRAZONOPYRROLIDINES

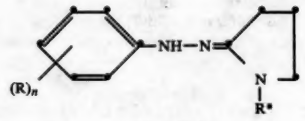
Jean-Claude Gehret, Aesch, and Walter Traber, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 21, 1984, Ser. No. 622,826

Int. Cl.[4] **C07D** *401/12;* **A61K** *31/44*

U.S. Cl. 514—343 **10 Claims**

1. A substituted phenylhydrazonopyrrolidine compound of the formula I



(I)

wherein

R is halogen or C_1–C_4-alkyl,

n is zero, 1 or 2,

R^* is the group —CH=N—R_1 or

R_1 is a pyridine group which is bound by way of a carbon

atom, and which is unsubstituted or substituted by a methyl group, or is a 2-thiazolyl group, and

R_2 is methyl or ethyl,

R_3 is C_1–C_4-alkyl, C_1–C_2-alkoxy or C_1–C_4-alkylthio, and

X is oxygen or sulfur,

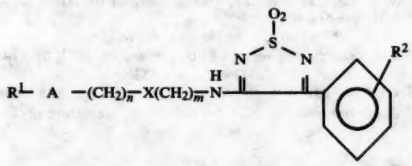
including the acid addition salt of a compound of the formula I.

4,567,191
AMINO-PHENYL-THIADIAZOLEDIOXIDES AS GASTRIC SECRETION INHIBITORS

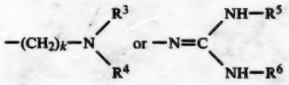
John J. Baldwin, Gwynedd Valley; Adolph Pietruszkiewicz, North Wales; William A. Bolhofer, Frederick, and William C. Lumma, Jr., Pennsburg, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 7, 1983, Ser. No. 501,943
Int. Cl.[4] C07D *285/10, 417/12;* A61K *31/41*
U.S. Cl. 514—362 7 Claims

1. Compounds having the formula:



wherein R^1 is hydrogen, loweralkyl,



wherein

R^3 and R^4 are independently hydrogen, loweralkyl, cycloloweralkyl or phenylloweralkyl or R^3 and R^4 may be joined to form, along with the nitrogen to which they are attached, a 5- or 6-membered heterocycle, which may also contain an oxygen, sulfur, SO, SO_2, or an N—R^7 linkage wherein R^7 is hydrogen or loweralkyl of from 1 to 3 carbon atoms;

R^5 and R^6 are independently hydrogen, loweralkyl, or 3,3,3-trifluoroethyl or R^5 and R^6 may be joined together to form a cyclic structure through a $-(CH_2)_m$-linkage;

n is 0 or 1;

m is 2 to 4;

k is 0 to 4;

X is oxygen, sulfur or methylene:

R^2 is hydrogen, halogen, loweralkyl, or loweralkoxy;

A is phenylene or a heterocycle selected from furan, thiophene, pyrrole, oxazole, oxadiazole, thiadiazole, thiazole, triazole, pyrazole, imidazole, pyridine, pyrimidine, pyrazine, benzofuran, benzoxazole and benzimidazole, provided that when A is a 5-membered heterocycle, or a benzo-fused 5-membered heterocycle containing one heteroatom, n is 1;

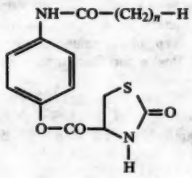
and, the physiologically acceptable salts and N-oxides thereof.

4,567,192
ACYLAMINOPHENOL DERIVATIVES

László Révész, Basel, and Trevor J. Petcher, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Apr. 30, 1984, Ser. No. 605,138
Claims priority, application Switzerland, May 4, 1983, 2423/83
Int. Cl.[4] C07D *277/56;* A01K *31/425*
U.S. Cl. 514—369 6 Claims

1. A compound of formula I



(I)

wherein n is an integer of from 1 to 5.

4,567,193
2-(FORMYLAMINO)-N-(1H-TETRAZOL-5-YL)BENZAMIDE AND USE AS ANTI-ALLERGICS

Norton P. Peet, and Shyam Sunder, both of Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jul. 22, 1983, Ser. No. 517,086
Int. Cl.[4] A61K *31/41;* C07D *257/06*
U.S. Cl. 514—381 3 Claims

1. 2-(Formylamino)-N-(1H-tetrazol-5-yl)benzamide and the pharmaceutically acceptable salts thereof.

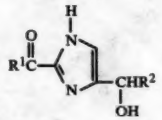
3. A method for inhibiting the result of antibody-antigen reactions in mammals which comprises administration to a mammal susceptible to allergic reaction of an effective amount of 2-(formylamino)-N-(1H-tetrazol-5-yl)benzamide or a pharmaceutically acceptable salt thereof.

4,567,194
2-ACYLIMIDAZOLE COMPOUNDS, THEIR SYNTHESIS AND USE AS MEDICINAL AGENTS

Udo Kroeplien, and Joachim Rosdorfer, both of Essen, Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 10, 1983, Ser. No. 473,931
Int. Cl.[4] C07D *233/64;* A61K *31/415*
U.S. Cl. 514—400 25 Claims

1. A 2-acylimidazole compound having the formula



its enantiomers, tautomers, and mixtures of optical isomers, wherein:

R^1 is an alkyl of 1 to 4 carbons, phenyl, benzyl, or phenylethyl; and

R^2 is alkyl of 1 to 6 carbons, hydroxyalkyl of 1 to 6 carbons, polyhydroxyalkyl of 1 to 6 carbons having up to one hydroxyl per carbon, phenyl, benzyl, or phenylethyl.

19. A method for preventing cell mediated, transplanted tissue rejection in an animal having a tissue transplant comprising lowering the vitamin B_6 blood level in the animal and administering to the animal a therapeutic amount of a compound of claim 1.

20. A method for preventing or alleviating cell-mediated autoimmune disease in a patient with said disease comprising lowering the vitamin B_6 blood level in the patient and administering a therapeutic amount of a compound of claim 1.

4,567,195

AZAPROSTACYCLINS, THEIR PREPARATION AND PHARMACEUTICAL USE

Norbert Schwarz; Werner Skuballa; Helmut Vorbrueggen; Jorge Casals-Stenzel; Ekkehard Schillinger, and Michael H. Town, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

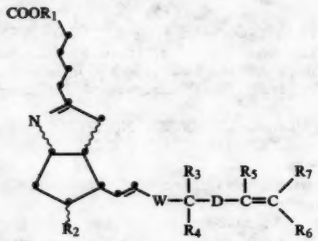
Division of Ser. No. 350,674, Feb. 22, 1982, Pat. No. 4,446,147. This application Mar. 21, 1984, Ser. No. 591,719

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3107100

Int. Cl.[4] C07D *209/52;* A61K *31/40*

U.S. Cl. 514—419 8 Claims

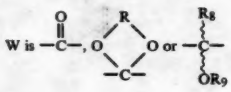
1. An azaprostacyclin of the formula



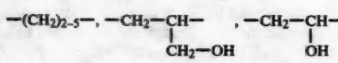
(I)

wherein

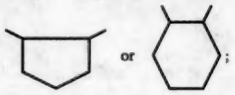
R_1 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; C_{1-4} alkoxy; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{4-10} cycloalkyl, (e) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (h) an aromatic heterocyclic of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms, (i) phenacyl, or (j) phenacyl substituted on the phenyl ring by bromine, phenyl, C_{1-4}-alkoxy, or di-C_{1-4}-alkoxy,



wherein R_8 is hydrogen or alkyl of 1–5 carbon atoms, R_9 is hydrogen, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid, the OR_9-group can be in the α- or β-position, and R is



-continued



R_2 is OH or OR_9,

R_3 and R_4 each independently is hydrogen, alkyl of 1–5 carbon atoms, or fluorine,

D is $—(CH_2)_2—$, or $—(CH_2)_2—$ substituted by C_{1-5}-alkyl R_5 together with R_6 forms a bond and R_7 is H or C_{1-2}-alkyl, or for the compounds wherein R_1 is H, a physiologically compatible salt thereof.

4,567,196

THIENO [2,3-b] PYRROLE COMPOUNDS AND THEIR USE IN ALLEVIATING PAIN

Michel Wierzbicki, Puteaux, France, assignor to ADIR, s.a.r.l., Neuilly-sur-Seine, France

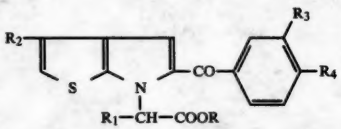
Filed Nov. 2, 1984, Ser. No. 667,909

Claims priority, application France, Nov. 10, 1983, 83 17866

Int. Cl.[4] C07D *495/06;* A61K *31/38*

U.S. Cl. 514—422 7 Claims

1. A compound selected from the group consisting of: thieno[2,3-b]pyrrole compounds of the formula I:



(I)

in which

R is selected from the group consisting of hydrogen straight-chain and branched alkyl having from 1 to 5 carbon atoms inclusive, alkali and alkaline-earth metals, ammonium and mono-, di- and tri-alkylammonium in which the and each alkyl group contain from 1 to 5 carbon atoms inclusive,

R_1 is selected from the group consisting of hydrogen straight-chain and branched alkyl having from 1 to 5 carbon atoms inclusive,

R_2 is selected from the group consisting of hydrogen straight-chain and branched alkyl having from 1 to 5 carbon atoms inclusive, phenyl and phenylalkyl in which the alkyl groups are straight-chain or branched and contain from 1 to 5 carbon atoms inclusive,

R_3 and R_4, which are the same or different, are each selected from the group consisting of hydrogen, halogen and straight-chain and branched alkyl and alkoxy and each having from 1 to 5 carbon atoms inclusive, and

R_3 and R_4 together represent a radical of the formula: —CH=CH—CH=CH— in order to form with the phenyl group to which they are bonded a naphthyl group.

7. A method for treating a living animal body afflicted with pain comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,567,197

1,3-DIOXAN-5-YLALKENOIC ACIDS

Andrew G. Brewster, and Peter W. R. Caulkett, both of Macclesfield, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

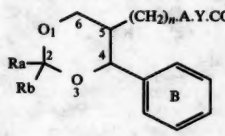
Filed May 6, 1983, Ser. No. 492,247

Claims priority, application United Kingdom, May 12, 1982, 8213702

Int. Cl.[4] A61K *31/335;* C07D *319/06*

U.S. Cl. 514—452 15 Claims

1. A 4-phenyl-1,3-dioxan-cis-5-ylalkenoic acid derivative of the formula I



I

wherein Ra and Rb are independently hydrogen, (2–6C)alkenyl, (1–8C)alkyl optionally bearing up to three halogeno substituents, independently hydrogen, (2–6C)alkenyl, (1–8C)alkyl optionally bearing up to three halogeno substituents, pentafluorophenyl, aryl or aryl(1–4C)alkyl, the latter two of which may optionally bear up to three substituents selected from halogeno, (1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkoxy, (1–4C-)alkylenedioxy, trifluoromethyl, cyano, nitro, hydroxy, (2–6C-)alkanoyloxy, (1–6C)alkylthio, (1–6C)alkanesulphonyl, (1–6C-)alkanoylamino, and oxapolymethylene of 2 to 4 carbon atoms, provided that when both Ra and Rb are alkyl or alkenyl, the total number of carbon atoms in Ra and Rb taken together is 8 or less; or Ra and Rb together form polymethylene of 2 to 7 carbon atoms, optionally bearing one or two (1–4C)alkyl substituents; Rc is hydroxy, (1–6C)alkanesulphonamido; n is the integer 1 or 2; A is ethylene or vinylene; Y is polymethylene of 2 to 5 atoms optionally bearing (1–4C)alkyl as a substituent; benzene ring B optionally bears one or two substituents selected from halogeno, (1–6C)alkyl, (1–6C)alkoxy, hydroxy, (2–6C)alkanoyloxy. (1–6C)alkanoylanino, trifluoromethyl and nitro; and the substituents at positions 4 and 5 of the dioxane ring have cis-relative stereochemistry; or for those compounds wherein Rc is hydroxy, a salt thereof with a base affording a physiologically acceptable cation.

11. A salt as claimed in claim 1 which is an alkali metal, alkaline earth metal, aluminium or ammonium salt, or a salt with an organic amine or quaternary base, forming a physiologically acceptable cation.

14. A pharmaceutical composition for use in antagonising one or more of the actions thromboxane A_2 in a warm-blooded animal requiring such treatment which comprises an antagonistically effective amount of a compound of formula I, or a salt thereof, as claimed in claim 1 together with a pharmaceutically acceptable diluent or carrier.

15. A method for antagonising one or more of the actions of thromboxane A_2 in a warm-blooded animal requiring such treatment which comprises administering to said animal an antagonistically effective amount of a thromboxane A_2 antagonistically active 4-phenyl-1,3-dioxan-cis-5-ylalkenoic acid derivative.

4,567,198

ETHANETHIOATES AND MERCAPTOAMIDES AND USE THEREOF AS ANALGESIC AND ENKEPHALINASE INHIBITORY COMPOUNDS

Francoisè Delevalleé , Vincennes; Roger Deraedt, Pavillons Sous Bois, and Odile Le Martret, Paris, all of France, assignors to Roussel Uclaf, Paris, France

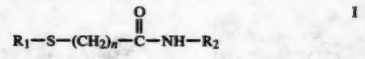
Filed Feb. 6, 1984, Ser. No. 577,032

Claims priority, application France, Feb. 7, 1983, 83-01863

Int. Cl.[4] A61K *31/265, 31/16;* C07C *103/12, 153/023*

U.S. Cl. 514—513 10 Claims

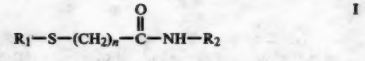
4. A method of relieving pain in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound selected from the group consisting of compound of the formula



I

wherein R_1 is selected from the group consisting of hydrogen and acetyl, n is 1 or 2 and when n is 1, R_2 is selected from the group consisting of phenyl, p-chlorophenyl and m-trifluoromethylphenyl and when n is 2, R_2 is selected from the group consisting of phenyl, p-chlorophenyl and m-trifluoromethylphenyl and their salts with non-toxic, pharmaceutically acceptable acids and bases.

7. A method of inhibiting enkephalinase in warm-blooded animals comprising administering to warm-blooded animals an enkephalinase inhibitory amount of at least one compound selected from the group consisting of compound of the formula



I

wherein R_1 is selected from the group consisting of hydrogen and acetyl, n is 1 or 2 and when n is 1, R_2 is selected from the group consisting of phenyl, p-chlorophenyl and m-trifluoromethylphenyl and when n is 2, R_2 is selected from the group consisting of phenyl, p-chlorophenyl and m-trifluoromethylphenyl and their salts with non-toxic, pharmaceutically acceptable acids and bases.

10. A compound selected from the group consisting of ethanethioate of S-[2-(4-chlorophenylamino)-2-oxo-ethyl], ethanethioate of S-[3-oxo-3-phenylamino-propyl], ethanethioate of S-[3-(4-chlorophenylamino)-3-oxo-propyl], and their salts with non-toxic, pharmaceutically acceptable acids and bases.

4,567,199

HALOBENZYL ESTERS

Patrick J. Crowley, Bracknell, England, assignor to Imperial Chemical Industries PLC, London, England

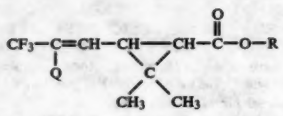
Continuation of Ser. No. 336,585, Jan. 4, 1982, abandoned. This application Oct. 6, 1983, Ser. No. 539,570

Claims priority, application United Kingdom, Jan. 21, 1981, 8101825; Aug. 27, 1981, 8126204

Int. Cl.[4] C07C *69/743;* A01N *53/00*

U.S. Cl. 514—531 6 Claims

1. A method of combating rootworms of the genus Diabrotica at a locus which comprises treating the locus with an insecticidally effective amount of a composition comprising an insecticidally effective amount of a compound of the formula:



wherein Q represents fluoro or chloro and R is selected from the group consisting of 2-chloro-4-fluorobenzyl, 2-chloro-5-fluorobenzyl and 2-chloro-6-fluorobenzyl, and a carrier therefor.

4,567,200

ESTERS OF MERCAPTO ACYL-CARNITINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Maria O. Tinti; Emma Quaresima; Carlo Bagolini, and Paolo deWitt, all of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

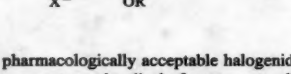
Filed Mar. 15, 1982, Ser. No. 358,502

Claims priority, application Italy, Mar. 31, 1981, 48166 A/81

Int. Cl.[4] A61K *31/22, 31/23;* **C07C** *149/243*

U.S. Cl. 514—547 **11 Claims**

1. Mercapto acyl carnitine esters of the general formula



(I)

wherein:

X^- is a pharmacologically acceptable halogenide ion;

R is the mercapto acyl radical of a mercapto alkanoic acid having from 2 to 10 carbon atoms; and

R_1 is a straight or branched alkyl radical having from 1 to 5 carbon atoms.

4,567,201

DIPHENOXYPROPANE DERIVATIVES AND COMPOSITIONS OF ANTIASTHMATIC AND ANTIINFLAMMATORY AGENTS THEREOF

Akira Nohara, and Yoshitaka Maki, both of Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

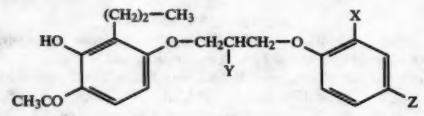
Filed Nov. 9, 1982, Ser. No. 440,297

Claims priority, application Japan, Nov. 25, 1981, 56-189812; Oct. 22, 1982, 57-186361

Int. Cl.[4] A61K *31/41, 31/09;* **C07D** *257/06;* **C07C** *43/205*

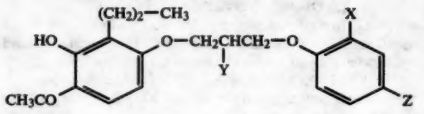
U.S. Cl. 514—571 **8 Claims**

1. A compound of the formula:



wherein X is a fluorine, chlorine, or bromine atom, Y is a hydrogen atom or a hydroxy group and Z is a carboxy group.

6. A member of the class consisting of antiasthmatic and antiinflammatory agents which contains an effective antiasthmatic amount in the case of the antiasthmatic agents and an effective amount in the case of the antiinflammatory agents of a compound of the formula



wherein X is a fluorine, chlorine, or bromine atom, Y is a hydrogen atom or a hydroxy group and Z is a carboxy group and a pharmaceutically acceptable carrier of vehicle therefore.

4,567,202

PHARMACEUTICAL AMITRIPTYLIN OXIDE PREPARATION AND PROCESS FOR ITS MANUFACTURE

Manfred Dürr, Pulheim-Dansweiler; Benedikt Gajdos, Cologne; Klaus-Dieter Gneuss, Cologne; Ekkehard Harhausen, Cologne, and Jürgen Seidel, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,491

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247676

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—656 **3 Claims**

1. A pharmaceutical composition containing a stabilized amitriptylin oxide dihydrate, an effective amount of an organic acid stabilizer selected from the group consisting of malic acid, tartaric acid and citric acid, and a pharmaceutically acceptable auxiliary or carrier, said stabilized amitriptylin oxide dihydrate being formed by dissolving amitriptylin oxide dihydrate and the organic acid acid either jointly or separately in water or an alcohol-water mixture, applying the resultant solution containing the amitriptylin oxide dihydrate and said organic acid to the auxiliary or carrier and evaporating the solvent.

4,567,203

COSMETICS INTEGRATED WITH EPICUTANEOUS SEBUM AND SEBUM-LIKE COMPOSITIONS

Igino Bonadeo, Via Cornalia 32, Milan, Italy

Continuation-in-part of Ser. No. 843,678, Oct. 19, 1977, abandoned. This application Jun. 22, 1979, Ser. No. 51,036

Int. Cl.[4] A61K *47/00*

U.S. Cl. 514—844 **10 Claims**

1. A cosmetic composition comprising a mixture of constituents selected from the group consisting of fatty acids, fatty esters, fatty hydrocarbons and fatty alcohols, said mixture being in a percent by weight ratio to obtain a required value of emulsification (HLB_r) of between 10.4 and 10.7 for a face treatment and of between 12.4 and 12.8 for a hair treatment and an emulsification value (HLB) of between 10.4 and 10.7 for emulsifying sebaceous face film and of between 12.4 and 12.8 for emulsifying sebaceous hair film wherein said fatty acids have a HLB_r of between 12.7 and 17; said fatty esters have a HLB_r of between 8.2 and 12.7, said fatty hydrocarbons have a HLB_r of between 8.2 and 12; and said fatty alcohols have a HLB_r of between 9.4 and 12.7.

4,567,204

METHOD FOR MAKING METHANOL

R. Lawrence Mednick, Roslyn Heights, N.Y., and David B. Blum, Wayne, N.J., assignors to Chem Systems, Inc., Tarrytown, N.Y.

Continuation of Ser. No. 325,507, Nov. 27, 1981, abandoned, which is a continuation of Ser. No. 120,903, Feb. 12, 1980, abandoned. This application Jul. 23, 1984, Ser. No. 633,231

Int. Cl.[4] C07C *29/16*

U.S. Cl. 518—700 **7 Claims**

1. A process for preparing methanol from synthesis gas

containing hydrogen and carbon monoxide comprising the steps:

(a) entraining from about 5 to about 40 wt. % of methanol-forming catalyst particles in an inert liquid, said catalyst particles having an average particle size of from about 10 to about 125 microns;

(b) contacting said synthesis gas with said entrained catalyst in a reaction zone at a temperature of from 100° C. to 500° C. and at a pressure of from 200 to 10,000 psia;

(c) withdrawing from said reaction zone the inert liquid with said entrained catalyst and cooling the same in a cooling zone;

(d) recycling said inert liquid with said entrained catalyst particles back to said reaction zone; and

(e) withdrawing from said reaction zone methanol and unreacted synthesis gas.

4,567,205

RUTHENIUM CATALYSTS, AND USE THEREOF FOR FISCHER-TROPSCH SYNTHESIS

Kym B. Arcuri; Charles H. Mauldin, and Dave H. Shaw, all of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 626,024, Jun. 29, 1984. This application May 20, 1985, Ser. No. 735,783

Int. Cl.[4] C07C *1/04*

U.S. Cl. 518—715 **15 Claims**

1. A process useful for the synthesis of hydrocarbons at reaction conditions from a feed constituting an admixture of carbon monoxide and hydrogen, which comprises contacting said feed with a catalyst which comprises ruthenium in catalytically active amount composited with titania, or titania-containing support, having a rutile:anatase ratio of at least about 2:3 and rhenium in amount sufficient to provide a weight ratio of rhenium:ruthenium which ranges from about 2:1 to about 1:4,sufficient at corresponding reaction conditions to obtain improved activity maintenance vis-a-vis a ruthenium catalyst otherwise similar except that it does not contain rhenium.

4,567,206

FLUOROCARBON POLYMERS AND PROCESSES FOR THEIR PREPARATION

Kiyohide Matsui, Sagamihara; Yoshiyuki Kikuchi, Tokyo; Tamejiro Hiyama, Sagamihara; Etsuko Tobita, Tokyo; Kiyoshi Kondo, Yamato; Akira Akimoto, Hohfu; Toru Seita, and Hiroyuki Watanabe, both of Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo and Sagami Chemical Research Center, Tokyo, both of, Japan

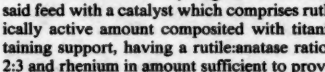
Filed Dec. 28, 1983, Ser. No. 566,431

Claims priority, application Japan, Dec. 28, 1982, 57-227443; Jun. 29, 1983, 58-116062; Oct. 17, 1983, 58-192473

Int. Cl.[4] C08D *5/20*; C08F *226/00*

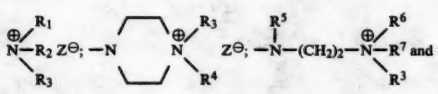
U.S. Cl. 521—27 **12 Claims**

1. A quaternary ammonium group containing fluorocarbon polymer comprising a perfluorocarbon main chain and a fluorinated pendant chain of the formula:

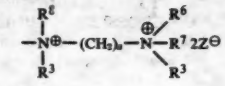


wherein:

X is fluorine, chlorine or $-CF_3$, l is an integer of 0 to 5, m is 0 or 1, n is an integer of 1 to 5 and Q is selected from the group consisting of:



-continued



wherein R^1 and R^2 are lower alkyl, aromatic, hydroxy lower alkyl or R^1 and R^2 together form tetramethylene or pentamethylene, R^3, R^4 and R^8 are lower alkyl, R^5 is hydrogen or lower alkyl or together form tetramethylene or pentamethylene, a is an integer of 3 to 5 and Z is a counter ion for the quaternary ammonium ion.

4,567,207

POLYMERIC MATERIAL ADAPTED FOR PHYSICO-CHEMICAL SEPARATION OF SUBSTANCES AND METHOD FOR PRODUCING SAME

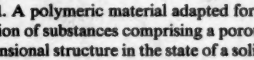
Nazar Y. Ljubman, ulitsa Dzhandosova, 166, kv. 38; Gulsara K. Imangazieva, ulitsa Dzhandosova, 69, kv. 112; Lyalya T. Nugmanova, Mikroraion Sairan, 10, kv. 48; Alexandr I. Uskov, 2 Mikroraion, 45, kv. 36; Tokhtobabu C. Sydykova, Mikroraion "Orbita-4", 6, kv. 41, and Zinaida I. Kim, ulitsa Dzhandosova, 69, kv. 47, all of Alma-Ata, U.S.S.R.

Filed Jul. 18, 1983, Ser. No. 514,480

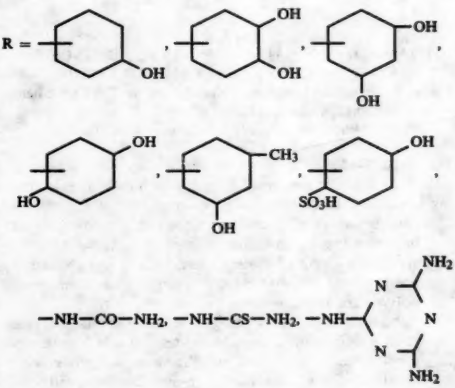
Int. Cl.[4] C08G *520*

U.S. Cl. 521—35 **22 Claims**

1. A polymeric material adapted for physico-chemical separation of substances comprising a porous material of a three-dimensional structure in the state of a solid dispersion with a pore diameter of from 0.0025 to 10 μm and a permeability coefficient of from 2×10^{-7} to 2×10^{-2} cm·sec^{-1}, and containing a polymer with an elementary unit of the formula:



wherein



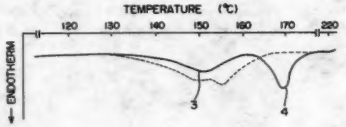
wherein n=0.2.

4,567,208

PRELIMINARILY FOAMED PARTICLES OF NON-CROSSLINKED POLYPROPYLENE-TYPE RESIN

Hideki Kuwabara, Hadano, and Yoshimi Sudo, Chigasaki, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,679
Claims priority, application Japan, Dec. 7, 1983, 58-230956
Int. Cl.[4] C08J 9/16; C08L 23/20, 23/14
U.S. Cl. 521—59 6 Claims



1. Preliminarily foamed particles of a non-crosslinked polypropylene copolymer resin comprising, as a base resin, a mixture of 10 to 95% by weight of an alpha-olefin/propylene random copolymer wherein the alpha-olefin has at least 4 carbom atoms and having an amount of the heat of crystallization of not more than 10 cal/g, as measured by differential scanning calorimetry, and 90 to 5% by weight of an ethylene/-propylene random copolymer having an ethylene content of from 3 to 15 mole%, said preliminarily foamed particles having been foamed under conditions such that the maximum temperature of the particles during foaming is in the range of from Tm−25° C. to Tm−5° C., wherein Tm is the temperature at which the melting of the resin particle ends, and wherein the crystal structure of the preliminarily foamed particles is such that when a differential scanning calorimetry thermogram is drawn by heating 1 to 3 mg of the preliminarily foamed particles to 220° C. at a rate of 10° C./min. by means of a differential scanning calorimeter, a high temperature peak is observed at a higher temperature than the temperature of the peak inherent to the base resin.

4,567,209

FOAMS OF IONICALLY ASSOCIATED BLENDS OF STYRENIC AND ETHYLENIC POLYMERS

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 24, 1984, Ser. No. 653,420
Int. Cl.[4] C08J 9/08
U.S. Cl. 521—81 3 Claims

1. A method for preparing a foam which comprises extruding a foamable resin composition comprising:

(a) at least about 60 parts by weight of a styrenic polymer having polymerized therein at least about 70 weight % of styrene or a ring alkyl-substituted styrene and about 1–30 weight % of an ethylenically unsaturated acid monomer polymerizable therewith;

(b) about 1–40 parts by weight of an ethylenic polymer having polymerized therein at least about 60 weight % ethylene and about 1–40 weight % of an ethylenically unsaturated acid monomer polymerizable therewith; and

(c) about 3–12 parts by weight, based upon 100 parts by weight of (a) and (b), of an alkali metal bicarbonate.

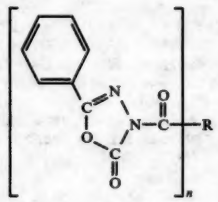
4,567,210

PROCESS FOR FOAMING THERMOPLASTIC AROMATIC POLYCARBONATES

Heinz Hammer, Cologne; Klaus Kircher, Leverkusen, and Rolf-Volker Meyer, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,996
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405418
Int. Cl.[4] C08J 9/10
U.S. Cl. 521—90 6 Claims

1. A process for foaming an aromatic thermoplastic polycarbonate at a temperature from 270° C. to 320° C., which also contains, if desired, a nucleating agent, in which a compound of the general formula



(I)

wherein

n is 1 and

R denotes C_1–C_{18}-alkoxy, C_6–C_{12}-cycloalkoxy, C_6–C_{18}-aryl, C_6–C_{12}-aryloxy, C_7–C_{18}-aralkyl, C_7–C_{18}-aralkoxy, C_7–C_{18}-alkaryl or C_7–C_{18}-alkaryloxy,

or wherein

n is 2 and

R denotes C_6–C_{18}-arylene, C_6–C_{18}-arylene dioxy, isopropylidene-bis-(phenylene-oxy) or C_1–C_5-alkylene,

or wherein

n is 2 and

R is a single bond,

and which must also have a decomposition temperature in bulk of at least 265° C., is used, in an amount of 0.02 to 5% by weight, based on the weight of thermoplastic polycarbonate, as a blowing agent in the presence of cyanuric acid in an amount of 0.0005 to 2% by weight, again based on the weight of thermoplastic polycarbonate.

4,567,211

NAPHTHALENIC DERIVATIZED PLASTICIZERS FOR POLYPHOSPHAZENE POLYMERS

Arthur E. Oberster, North Canton, Ohio, and John C. Vicic, Houston, Tex., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 4, 1985, Ser. No. 707,761
Int. Cl.[4] C08K 5/01
U.S. Cl. 521—98 14 Claims

8. A plasticized foam composition comprising a polyphosphazene polymer and a plasticizer of the formula:

$$AR{-}CH_2{-}AR{-}CH_2]_nAR$$

wherein n = 1, 2, 3 or 4 and each AR group is an independently substituted alkylated naphthalene ring.

4,567,212
NONSLUMPING, FOAMABLE POLYORGANOSILOXANE COMPOSITIONS CONTAINING ORGANOSILOXANE GRAFT COPOLYMERS

Therese M. Bauman, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 720,768, Apr. 8, 1985, which is a continuation-in-part of Ser. No. 664,913, Oct. 26, 1984. This application Jun. 24, 1985, Ser. No. 747,597
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—122 **11 Claims**

1. A foam obtained by dispensing and curing in the presence of atmospheric moisture a foamable composition obtained by mixing under substantially anhydrous conditions

(A) a moisture-curable RTV elastomeric organosiloxane composition comprising the product obtained by mixing in the absence of atmospheric moisture at least one polydiorganosiloxane curable in the presence of a moisture reactive crosslinker, a moisture reactive crosslinker and, optionally, a curing catalyst, the amount of said crosslinker being sufficient to cure said polymer;

(B) less than 12 percent by weight, based on the weight of said foamable composition of a finely divided filler;

(C) from 10 to 50 percent by weight of said foamable composition, of a liquified blowing agent sufficient to form a foam following release of said composition into an area under atmospheric pressure; and

(D) from 5 to 80 percent, based on the combined weight of all diorganosiloxane polymers present in said composition, of an organosiloxane graft copolymer obtained by the peroxide catalyzed polymerization of at least one ethylenically unsaturated organic monomer in the presence of a liquid, hydroxyl endblocked polydiorganosiloxane.

4,567,213
INK JET PRINTING COMPOSITION

Yog R. Bhatia, Glen Ellyn, and Herman Stallworth, Chicago, both of Ill., assignors to Videojet Systems International, Inc., Elk Grove Village, Ill.

Filed Oct. 20, 1983, Ser. No. 543,828
Int. Cl.[4] C09D 11/02, 11/10
U.S. Cl. 523—160 **9 Claims**

1. An ink composition for use in ink jet printing consisting essentially of:

(a) 5 to 25% by weight of a styrene-acrylic acid copolymer, said copolymer having a molar ratio of styrene to acrylic acid from 1 to about 4;

(b) 0.5 to 8% by weight of a soluble dye;

(c) a solvent system of a lower alkanol and a lower aliphatic ketone, said alkanol being present in an amount of 10 to 85% by weight, and said ketone being present in an amount of 10 to 60% by weight;

(d) 0 to about 50% by weight of at least one evaporation retardant;

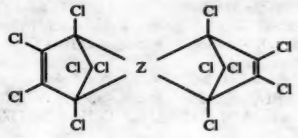
said composition having a pH in the range of 1 to 7 and containing less than 5% by weight of water.

4,567,214
FLAME RETARDANT POLYOLEFIN COMPOSITIONS

Charles S. Ilardo, Tonawanda, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,482
Int. Cl.[4] C08K 3/10
U.S. Cl. 523—216 **24 Claims**

1. A flame retardant polymer composition comprising, in percent by weight, (1) about 25 to about 75 percent of a polyolefin, (2) about 0.01 to about 3.0 percent of a compound of iron (3) about 1 to about 30 percent of a compound of antimony, (4) about 5 to about 50 percent of a non-basic compound of magnesium, and (5) about 2 to about 50 percent of a chlorinated organic compound of the formula



wherein Z is a tetravalent saturated cyclic radical having at least 4 carbon atoms which may be substituted by chlorine, bromine, fluorine or alkyl of 1 to 6 carbon atoms.

4,567,215
PRODUCT AND PROCESS RELATING TO HARDBOARD

Fred L. Jackson, Littleton, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Mar. 8, 1985, Ser. No. 709,639
Int. Cl.[4] C08K 3/34
U.S. Cl. 523—218 **24 Claims**

1. A hardboard material comprising:

(a) about 1–40 wt % of a porous additive having a particle size in the range of about 0.1–2 mm;

(b) about 65–97 wt % of cellulose fibers;

(c) about 2–5 wt % binder; and

(d) about 1–4 wt % wax.

4,567,216
THERMOPLASTIC MODIFIED EPOXY COMPOSITIONS

Shahid Qureshi, Edison, and Hugh C. Gardner, Somerville, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

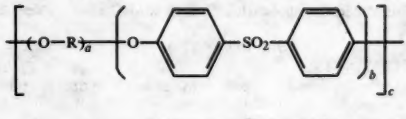
Filed Dec. 22, 1983, Ser. No. 564,393
Int. Cl.[4] C08L 63/00; C08K 3/00
U.S. Cl. 523—400 **21 Claims**

1. A thermoplastic modified epoxy composition comprising:

(a) a bis(2,3-epoxycyclopentyl)ether.

(b) a diamine hardener selected from one or more of 4,4'-diaminodiphenyl ether, 4,4'-**diaminodiphenyl methane,** 3,3'-diaminodiphenyl methane, 4,4'-diaminodiphenyl sulfone, 3,3'-diaminodiphenyl sulfone, 3,3'-diaminobenzophenone, m-phenylenediamine, p-phenylenediamine, 4,4'-diaminodiphenylpropane, 4,4'-diaminodiphenyl sulfide, 1,4-bis(p-aminophenoxy)benzene, 1,4-bis(m-aminophenoxy)benzene, 1,3-bis-(m-aminophenoxy)benzene, 1,3-bis(p-aminophenoxy)benzene, adducts of epoxy resin with the above diamines, or the adducts of a bisphenol-A epoxy resin with a molar excess of 4,4-diaminodiphenyl sulfone, and

(c) a thermoplastic selected from one or more of the following: polycaprolactone, polyetherimide, phenoxy, polyarylether of the formula:



wherein R is selected from the residuum of hydroquinone, dihydroxydiphenyl sulfone or 4,4'-biphenol, a is 1, b is 1 or greater, and c is 5 to 100.

4,567,217

STEERING WHEEL MADE OF SOFT RESIN

Yoshio Yamazaki, Aichi; Masahiro Takimoto, Mie, and Satoshi Ohta, Aichi, all of Japan, assignors to Toyoda Gosei Co. Ltd., Aichi, Japan

Filed Jan. 24, 1985, Ser. No. 694,314

Claims priority, application Japan, Jan. 27, 1984, 59-11884

Int. Cl.[4] C08L *27/00*; B32B *15/08*; B62D *1/04*; C08K *5/10*

U.S. Cl. 524—296 4 Claims

1. A steering wheel produced by injection molding a resin composition comprising (i) a crosslinked vinyl chloride polymer having a gel fraction of at least 20% and an non-gelled portion having an average polymerization degree of from 2000 to 3000, (ii) an non-crosslinked vinyl chloride homopolymer having an average polymerization degree of from 800 to 1000, and (iii) a liquid plasticizer, wherein the weight ratio of polymer component (i) to polymer component (ii) is from 50/50 to 80/20 and (iii) the amount of liquid plasticizer is from 70 to 130 parts by weight per 100 parts by weight of the total amount of the two polymers (i) and (ii).

4,567,218

HALOGENATED BISPHENOL A ETHER FLAME RETARDANT FOR ABS POLYMERS

Thomas J. Petiet, Greenville, N.Y., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation of Ser. No. 575,786, Feb. 1, 1984, abandoned, which is a continuation of Ser. No. 520,538, Aug. 5, 1983, abandoned, which is a continuation of Ser. No. 414,454, Sep. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 48,570, Jun. 14, 1979, abandoned. This application Feb. 27, 1985, Ser. No. 706,384

Int. Cl.[4] C08K *5/06*

U.S. Cl. 524—373 3 Claims

1. A flame-retardant acrylonitrile-butadiene-styrene copolymer composition comprising said copolymer and from about 5 to about 35 percent by weight of the total composition of bis(2,4,6-tribromophenoxyethyl)tetrabromobisphenol A ether.

4,567,219

COMPOSITION FOR COVER OF GOLF BALLS

Ichiro Tominaga, Kobe, and Taketo Matsuki, Nishinomiya, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jul. 5, 1984, Ser. No. 627,718

Claims priority, application Japan, Jul. 6, 1983, 58-123899

Int. Cl.[4] A63B *37/12*; C08L *33/02*

U.S. Cl. 524—413 5 Claims

1. A cover composition for golf balls consisting essentially of an ionomer resin which is an ionic copolymer comprising units of an α-olefin and units of a monovalent or bivalent metal salt of an unsaturated monocarboxylic or dicarboxylic acid and 1 to 15 parts by weight of a linear low density polyethylene per 100 parts by weight of said ionomer resin.

4,567,220

PRODUCTION OF COPPER(II) HYDROXIDE PHOSPHATE WITH A LIGHT NATURAL COLOR AND AN AVERAGE GRAIN SIZE LESS THAN 10 MICRONS

Ralf Schüler, Recklinghausen, and Günther Maahs, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,838

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342292

Int. Cl.[4] C08K *3/10*

U.S. Cl. 524—413 8 Claims

1. In the process for producing copper(II) hydroxide phosphate from basic copper carbonate by treatment with phosphoric acid, the improvement comprising:

(a) selecting said basic copper carbonate having a bulk density less than 800 grams per liter;

(b) treating said selected basic copper carbonate in aqueous dispersion with at least stoichiometric quantities of said phosphoric acid to form a mixture at temperatures not exceeding 70° C.;

(c) mechanically agitating said mixture at said temperature not exceeding 70° C.;

(d) heating said agitated mixture to the boiling point thereof; and

(e) separating said copper(II) hydroxide phosphate having the formula $Cu_3(PO_4)_2.Cu(OH)_2$ and a light, natural color with a mean grain size less than 10 microns from said boiled mixture.

4,567,221

WATER RESISTANT COMPOSITIONS

Hitoshi Maruyama; Taku Tanaka, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

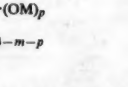
Filed Mar. 8, 1984, Ser. No. 587,564

Claims priority, application Japan, Mar. 31, 1983, 58-56902; Mar. 31, 1983, 58-56907

Int. Cl.[4] C08L *3/22*

U.S. Cl. 524—436 8 Claims

1. A composition which comprises a modified polyvinyl alcohol, having a silyl group in the molecule, and an inorganic substance selected from those containing aluminum, silica and magnesium; wherein the silyl group in the molecule is a silyl group of the formula (I)



(I)

wherein

m=0–2 and p=1–3, with the proviso that $m+p \leqq 3$;

M is a hydrogen atom or an alkali metal;

R^1 is (C_1–C_5) alkyl; and

R^2 is (C_1–C_{40}) alkoxyl, (C_1–C_{40}) acyloxyl, or (C_1–C_{40}) alkoxyl or (C_1–C_{40}) acyloxyl having a substituent containing oxygen; wherein the mixing ratio by weight of the modified polyvinyl alcohol having a silyl group in the molecule to the inorganic substance is in the range of about 5/95 to 99/1; wherein

the modified polyvinyl alcohol contains about 0.01–10 molar % of monomer unit containing a silyl group in the molecule.

4,567,222

PROCESS FOR PREPARING BITUMEN-POLYMER COMPOSITIONS, APPLICATION TO THESE COMPOSITIONS OF THE OBTENTION OF COVERINGS AND MOTHER SOLUTION OF POLYMER USABLE FOR THE OBTENTION OF THE SAID COMPOSITIONS

Germain Hagenbach, Vernaison; Paul Maldonado, St Symphorien d'Ozon, and Jacques Maurice, Pau, all of France, assignors to Elf France, Paris, France

Division of Ser. No. 502,827, Jun. 9, 1983, Pat. No. 4,554,313. This application Feb. 21, 1985, Ser. No. 703,916

Claims priority, application France, Jun. 10, 1982, 82 10095

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—476 22 Claims

1. A polymer mother solution for the preparation of bitumen-polymer compositions, comprising a hydrocarbon oil having a distillation range, at atmospheric pressure comprised between 100° C. and 450° C., and in solution in the oil, from about 5 to 40% by weight of the oil of a styrene conjugated diene copolymer and from about 0.1 to 15% by weight of the oil of a sulphur source, wherein the sulphur source comprises a polysulphide of the formula:

$R_1—(S)_m—R—(S)_m)_xR_2$

wherein:

R_1 and R_2 are each independently a C_1 to C_{20} saturated monovalent hydrocarbon radical, a C_1 to C_{20} unsaturated monovalent hydrocarbon radical or R_1 to R_2 can be linked to form a C_1 to C_{20} saturated divalent hydrocarbon radical or a C_1 to C_{20} unsaturated divalent hydrocarbon radical;

R is a C_1 to C_{20} saturated divalent hydrocarbon radical or a C_1 to C_{20} unsaturated divalent hydrocarbon radical;

$—(S)_m$ is a divalent group of sulphur atoms, wherein m can be different for each group and represents a whole number of from 1 to 6 with at least m in one group being at least 2; and

x represents a whole number ranging from 0 to 10.

4,567,223

POLYOLEFIN CONTAINING HOT-MELT ADHESIVES HAVING SHORT SET TIME AND BOTH GOOD LOW AND HIGH TEMPERATURE BOND STRENGTH PROPERTIES

William A. Ames, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,189

Int. Cl.[4] C08L *23/14, 23/06, 23/26, 51/06*

U.S. Cl. 524—489 **8 Claims**

1. A hot-melt adhesive composition having a viscosity of about 750 to about 4,000 cp. at 177° C. and a set time of less than about 10 seconds which provides bonds having good low and high temperature properties comprising a blend of

(a) about 70 to 50 percent by weight of at least one modified propylene/C_4 to C_{10} higher 1-olefin copolymer prepared by reacting the propylene/higher olefin with an unsaturated polycarboxylic acid, anhydride or monoester thereof and containing 95 to 70 mole percent having an acid number of at least 5 and having a melt viscosity of 1,500 to 20,000 centipoise at 177° C.,

(b) about 20 to about 35 percent by weight of at least one tackifier resin selected from the group consisting of hydrocarbon resin and polyterpene resins having a softening point of about 95° C. to about 135° C., and

(c) about 5 to about 15 percent by weight of a high density, low viscosity polyethylene wax having a melt viscosity of about 5 to 500 cp. at 150° C. and melting point of about 105° C. to 140° C.

4,567,224

BIAXIALLY ORIENTED CONTAINER EXCELLENT IN HEAT RESISTING PROPERTY AND PRESSURE RESISTING PROPERTY

Daiichi Aoki; Yoshinori Nakamura, and Hiroyuki Orimoto, all c/o Nissei ASB Machine Co., Ltd., 6100-1, Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-, Japan

Filed Mar. 25, 1985, Ser. No. 715,276

Claims priority, application Japan, Mar. 30, 1984, 59-62655

Int. Cl.[4] C08K *3/40*

U.S. Cl. 524—494 **6 Claims**

1. A biaxially oriented container excellent in heat resisting property and pressure resisting property, said container being formed by biaxially orienting a thermoplastic resin containing glass fibers to a value more than 3 of area stretching magnification, characterized in that said container contains said glass fibers in an amount of 0.3 to 10 weight % and is thermally fixed in the range of temperature from 70° to 180° C.

4,567,225

RUBBER COMPOSITION FOR TIRE TREADS

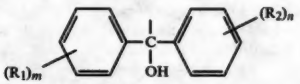
Makoto Misawa, Hiratsuka; Tetsuya Mizoguchi, Isehara; Kinya Kawakami, Ninomiyamachi, and Asahiro Ahagon, Fujisawa, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 751,906

Int. Cl.[4] C08L *7/00, 9/00, 9/06*

U.S. Cl. 524—526 **16 Claims**

1. A rubber composition for tire treads, comprising a total of 100 parts by weight of rubber components including 50 to 90 parts by weight of natural rubber and/or polyisoprene rubber and 10 to 50 parts by weight of polybutadiene rubber, which rubber composition is characterized by said polybutadiene rubber having a 1,2-bond unit content in the range of 40 to 90 mol % and having at least one atomic group per one molecular chain of the polybutadiene rubber so that there is 0.05 to 1 part by weight of said atomic group per 100 parts by weight of the polybutadiene rubber on the average, said atomic group being represented by the following formula:



wherein R_1 and R_2 each denote a hydrogen atom or a substituent selected from the group consisting of an amino group, an alkylamino group, a dialkylamino group and combinations thereof and m and n each denote an integer in the range of 1 to 5, said atomic group being joined in the form of a carbon-carbon bond to the molecular chain of said polybutadiene rubber.

3. A rubber composition according to claim 1, wherein a softening agent is incorporated in an amount of 1 to 40 parts by weight and carbon black in an amount of 5 to 70 parts by weight, respectively based on a total of 100 parts by weight of rubber components.

4,567,226

ELASTOMERIC BLOCK COPOLYAMIDES

Ulrich Grigo, New Martinsville, W. Va.; Karl-Heinz Köhler; Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany; Leo Morbitzer, Cologne, Fed. Rep. of Germany; Josef Merten, Korschenbroich, Fed. Rep. of Germany; Ludwig Trabert, Krefeld, Fed. Rep. of Germany, and Walter Heitz, Kirchhain, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,539

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1982, 3200020

Int. Cl.[4] C08F *8/30;* **C08L** *23/00, 51/00*

U.S. Cl. 524—538 **13 Claims**

1. Elastomeric block copolyamides produced from

I. 1 to 65%, by weight of the elastomeric block copolyamides, of hydrogenated diene polymers containing as end groups carbonate ester, —OH, $—NH_2$, carboxylic acid or carboxylic acid ester groups where said hydrogenated diene polymers have a degree of hydrogenation of at least 95 mole percent and have a molecular weight Mn of from about 400 to 6000 and

II. 99 to 35%, by weight of the elastomeric block copolyamides, of polyamides or polyamide-forming components.

4,567,227

BLEND OF WHOLLY AROMATIC POLYESTER AND POLY(ESTER-AMIDE) CAPABLE OF EXHIBITING AN ANISOTROPIC MELT PHASE

Gabor D. Kiss, Bedminster, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,184
Int. Cl.[4] C08L 67/02, 77/12
U.S. Cl. 524—538 55 Claims

1. A polymer blend formed by melt-mixing which when molten is capable of exhibiting an anisotropic melt phase and which following injection-molding is capable of exhibiting at least one property selected from the group consisting of tensile strength, tensile modulus, flexural strength, and flexural modulus, which exceeds that of each of the polymeric components of the blend when separately injection-molded comprising:

(a) approximately 5 to approximately 95 percent by weight, based upon the total weight of components (a) and (b), of a melt-processable wholly aromatic polyester which is capable of forming an anisotropic melt phase and which is substantially free of amide linkages; and

(b) approximately 5 to approximately 95 percent by weight, based upon the total weight of components (a) and (b), of a melt-processable poly(ester-amide) which is capable of forming an anisotropic melt phase.

4,567,228

AQUEOUS DISPERSION, INTERNALLY SILYLATED AND DISPERSED POLYURETHANE RESINS, AND SURFACES CONTAINING SAME

Peter C. Gaa, and David E. Dana, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 21, 1984, Ser. No. 612,207
Int. Cl.[4] C08G 18/38
U.S. Cl. 524—588 36 Claims

1. Water dispersible, ungelled, silylated material comprising the polyerized reaction product of:

(a) organic polyisocyanate,

(b) active hydrogen-containing material having at least two active hydrogens per molecule,

(c) organosilane having at least one isocyanate reactable group on one organic moiety of the silane and having at least one alkoxy, acyloxy, or hydroxy group bonded to the silicon atom, wherein, said organic polyisocyanate and said reactive hydrogen-containing material are predominantly difunctional in the isocyanate polyaddition reaction, and where the polymerized reaction product is formed at a temperature less than 200° C. and in a substantially anhydrous medium and where the reaction product has a substantial number of siliconate anions selected from the group consisting of, $[SiO^-]$, $[SiO^=]$, $[SiO_3^{\equiv}]$, and mixtures thereof.

4,567,229

ARYLOXY-ALKOXY SUBSTITUTED POLYPHOSPHAZENES

F. Alexander Pettigrew, and Harold R. Penton, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 18, 1984, Ser. No. 683,028
Int. Cl.[4] C08G 79/04
U.S. Cl. 524—610 12 Claims

1. A peroxide cured polyphosphazene composition having a non-flaming smoke rating below about 200 Dm as measured by the AMSI/ASTM E 662-79 method on a test specimen 76 mills thick, said composition comprising a cured polyphosphazene gum containing about 30–120 parts by weight of inorganic filler for each 100 parts of polyphosphazene and optionally other conventional compounding ingredients, said polyphosphazene gum having a $-P<=N)_n$ backbone in which n has an average value of about 100–1,000,000 or more and the phosphorus substituents comprise about 20–80 mole percent phenoxy, 20–80 mole percent lower alkylphenoxy and 2–30 mole percent alkoxy and said substituents are randomly distributed along said backbone.

4,567,230

1-COMPONENT COATING COMPOSITION, UTILIZATION THEREOF AND PROCESS FOR MANUFACTURING A PROTECTION COATING

Rainer-Leo Meyer; Reinmar John, both of Bühl; Rolf Nagel, Baden-Baden, and Günter Müller, Obersasbach, all of Fed. Rep. of Germany, assignors to BGB-Gesellschaft Reinmar John & Rainer Leo Meyer and Olga Meyer, both of Buhl, Fed. Rep. of Germany

PCT No. PCT/EP83/00246, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01158, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 15, 1983, Ser. No. 611,009
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234262; Sep. 15, 1982, 3234261
Int. Cl.[4] C08K 3/08
U.S. Cl. 524—786 16 Claims

1. Moisture-setting single-component coating composition, comprising from about:

15 to 70 wt.-% polyurethane-forming isocyanate,

5 to 25 wt.-% light-colored, liquid, aromatic hydrocarbon resin of low molecular weight containing hydroxyl groups,

0.2 to 2 wt.-% antisettling agents,

10 to 35 wt.-% foliated fillers,

2 to 25 wt.-% tinting pigment,

1 to 5 wt.-% moisture-binding agent, balance, but not less than 5% by weight, of conventional paint solvent.

4,567,231

EMULSIONS OF REINFORCED POLYDIORGANOSILOXANE LATEX

David J. Huebner, and John C. Saam, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 25, 1984, Ser. No. 624,546
Int. Cl.[4] C08L 83/00; C08K 3/34; C08F 2/32; C08L 83/06
U.S. Cl. 524—837 21 Claims

1. A method of producing an aqueous latex of crosslinked polydiorganosiloxane consisting essentially of

(A) homogenizing immediately after admixing, a mixture consisting essentially of

(1) 100 parts by weight of polydiorganosiloxane of the formula

$$HO(R_2SiO)_xH$$

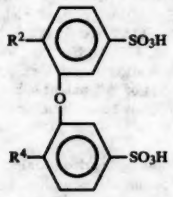
wherein each R is a radical selected from the group consisting of methyl, ethyl, propyl, phenyl, vinyl, allyl, and 3,3,3-trifluoropropyl, and x is an average value in the range of from 3 to 100 inclusive

(2) 0.5 to 15 parts by weight of an alkoxy silicon compound selected from the group consisting of silane of the formula

$$R'_aSi(OR^3)_{4-a}$$

where R' is a monovalent hydrocarbon radical having up to 12 carbon atoms, R^3 is an alkyl radical having from 1 to 6 inclusive carbon atoms, and a is 0 or 1; a partial hydrolyzate of the silane where the partial hydrolyzate is soluble in the polydiorganosiloxane (1); and mixtures of silane and partial hydrolyzate,

(3) from 15 to 100 millimoles of surface active anionic catalyst per kilogram of polydiorganosiloxane, where said catalyst is selected from the group consisting of a compound of the formula $R^2C_6H_4SO_3H$ wherein R^2 is a monovalent hydrocarbon radical of at least 6 carbon atoms; a compound of the formula R^2OSO_2OH wherein R^2 is as defined above; a compound of the formula



wherein R^2 is as defined above and R^4 is hydrogen or R^2; and mixtures thereof, and

(4) greater than 1 part by weight of colloidal silica present as an acidic sol in water, to yield an oil-in-water emulsion, then

(B) maintaining the emulsion produced in (A) at a temperature of from 15° to 30° C. for at least 5 hours at a pH of less than 5 until a crosslinked polymer is formed to yield a latex which produces an elastomer upon removal of the water at room temperature.

4,567,232

CONTINUOUS PREPARATION OF RUBBER-MODIFIED POLYMERS OF VINYL-AROMATICS

Adolf Echte, Ludwigshafen; Hermann Gausepohl, Mutterstadt; Juergen Hambrecht, Neckargemuend-Dilsberg, and Karl Gerberding, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 445,859, Dec. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 324,985, Nov. 25, 1981, abandoned. This application Sep. 13, 1984, Ser. No. 650,568

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047303

Int. Cl.⁴ C08F *279/02*

U.S. Cl. 525—53 **2 Claims**

1. A process for the continuous preparation of rubber-modified polymers of vinyl-aromatics, by polymerizing a mixture which contains

(a1) one or more monomeric aromatic vinyl compounds

(a2) one or more elastomeric polymers, in an amount of from 3 to 30% by weight, based on monomer (a1), with or without

(a3) a solvent in the presence of

(b) free radical initiators, with or without

(c) chain transfer agents, and with or without

(d) lubricants,

at from 80° to 180° C., with stirring, in a cascade comprising a first and second or more isothermally operated reaction zones consisting of stirred reactors, and one or more additional reaction zones, preferably tube reactors, and then freeing the polymer obtained, in a devolatilization zone, from vinyl-aromatic monomers and from solvents, if any, and recycling the solvents and any residual monomers to the process, wherein monomer conversion is adjusted so that the elastomer phase is the continuous phase in the first stirred reactor and the disperse phase in the second stirred reactor, and that the residence time of the reactants in the first stirred reactor is from 1 to 35 minutes.

4,567,233

HEAT AND IMPACT RESISTANT RESIN COMPOSITION

Hiromi Tomono, Yokkaichi; Takashi Kokubo, Suzuka; Kazuki Yamaguchi, Yokkaichi, and Sadao Ikuma, Suzuka, all of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 575,298

Claims priority, application Japan, Jun. 15, 1983, 58-107305

Int. Cl.⁴ C08L *51/04, 53/04*

U.S. Cl. 525—71 **7 Claims**

1. A heat and impact resistant resin composition which comprises from 10 to 90 parts by weight of a copolymer (A) comprising from 90 to 50% of residues of a vinyl aromatic compound selected from the group consisting of styrene, α-methylstyrene, p-methylstyrene, t-butylstyrene and a halogenated styrene, from 10 to 50% of residues of a maleimide compound and from 0 to 30% of residues of a vinyl compound copolymerizable therewith; from 0 to 50 parts by weight of a copolymer (B) comprising from 90 to 40% of residues of a vinyl aromatic compound as defined above and from 10 to 60% of residues of an unsaturated nitrile compound selected from the group consisting of acrylonitrile, methacrylonitrile and a mixture thereof; from 5 to 89 parts by weight of a graft copolymer (C) produced by polymerizing from 25 to 70% by weight of particles of a rubber latex selected from the group consisting of polybutadiene, a styrene-butadiene copolymer, an acrylonitrile-butadiene copolymer, a homopolymer or copolymer of an alkyl acrylate, an ethylene-propylene copolymer and an ethylene propylene-non-conjugated diene terpolymer, said rubber latex having a glass transition temperature of not higher than 0° C. and an average particle size of from 0.1 to 0.5 μm with from 75 to 30% by weight of a resin comprising from 90 to 40% of residues of the vinyl aromatic compound as defined for copolymer (A) and from 10 to 60% of residues of an unsaturated nitrile compound selected from the group consisting of acrylonitrile, methacrylonitrile and a mixture thereof; and from 1 to 45 parts by weight of a graft copolymer (D) produced by polymerizing from 2 to 17% by weight of particles of a rubber latex as defined above having a glass transition temperature of not higher than 0° C. and an average particle size of from 0.7 to 4 μm, with from 98 to 83% by weight of a resin comprising from 90 to to 40% of residues of the vinyl aromatic compound as defined for copolymer (A) and from 10 to 60% of residues of the unsaturated nitrile compound as defined for graft copolymer (C), wherein the amount of the graft copolymer (C) is from 97 to 50% by weight of the total amounts of the graft copolymers (C) and (D).

4,567,234

GRAFT COPOLYMERS OF ALKYL METHACRYLATES ONTO CROSS-LINKED BUTADIENE - ALKYL ACRYLATE COPOLYMERS AND THEIR USE AS IMPACT MODIFIERS

Gilles Meunier, Lescar, France, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jun. 22, 1984, Ser. No. 623,645

Claims priority, application France, Aug. 31, 1983, 83 13998

Int. Cl.⁴ C08L *39/04, 51/00*

U.S. Cl. 525—73 **30 Claims**

1. A synthetic resin composition having improved impact strength which comprises

(a) a thermoplastic polymer

(b) from 0.5 to 50 parts by weight per 100 parts by weight of thermoplastic polymer of a graft copolymer impact additive which comprises:

(i) a backbone consisting essentially of a statistical copolymer of butadiene or isoprene with an alkyl acrylate of C_2 to C_{12} alkyl, and a polyfunctional crosslinking agent copolymerizable with the diene and alkyl acrylate, said polyfunctional cross-linking agent having at least two allyl or vinyl unsaturated [CH_2=C] groups and being present in a molar proportion of from about 0.02% to about 10%, and wherein the butadiene or isoprene represents from 0.5 to about 35% of the weight of the backbone, and

(ii) a polymer grafted onto said backbone, said grafted polymer consisting essentially of a polymer of a C1–C4 alkyl methacrylate said grafted polymer representing from 10 to 200% of the weight of the backbone.

4,567,235

POLYAMIDE-RUBBER BLENDED COMPOSITION

Koji Sasaki, and Junji Koizumi, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 31, 1984, Ser. No. 666,672
Claims priority, application Japan, Oct. 31, 1983, 58-204503
Int. Cl.[4] C08F 8/00; C08L 31/00
U.S. Cl. 525—113 10 Claims

1. An polyamide-rubber blended composition having improved resistance to ozone, stress whitening and gasoline prepared by mixing together with heating the following components:

(a) from 70 to 20 volume percent of a rubber composition consisting of:

(i) 30 to 70 volume percent of an acrylonitrile-butadiene copolymer rubber containing at least 0.7 weight percent of a carboxyl group in the polymer, and

(ii) 70 to 30 volume,percent of an epichlorohydrin rubber;

(b) 30 to 80 volume percent of a polyamide resin; and

(c) at least 0.1 parts by weight of a polyepoxy compound in terms of the weight of the epoxy group per 100 parts by weight of the rubber composition of component (a).

4,567,236

NOVEL POLYMER BLENDS

David J. Goldwasser, Cheshire, and Richard W. Oertel, III, Guilford, both of Conn., assignors to The Upjohn Co., Midland, Mich.

Filed Jul. 18, 1983, Ser. No. 514,414
Int. Cl.[4] C08F 8/30; C08L 75/00
U.S. Cl. 525—127 8 Claims

1. A polymer blend characterized by high impact resistance, high flexural modulus and a heat deflection temperature of at least 50° C. at 264 psi which comprises a blend of:

(a) from 3 to 30 parts by weight, per 100 parts by weight of said blend, of a polymeric impact modifier which is incompatible with the major component of the blend and is a multiphase composite interpolymer based on a polyalkyl acrylate; and, as the balance of said blend,

(b) a polyurethane glass which is the product of reaction of:

(i) an organic polyisocyanate selected from the group consisting of 4,4'-methylenebis(phenyl isocyanate), mixtures of 4,4'-methylenebis(phenyl isocyanate) and 2,4'-methylenebis(phenyl isocyanate), and liquid forms of 4,4'-methylenebis(phenyl isocyanate);

(ii) at least one aliphatic glycol chain extender having a molecular weight from about 50 to about 400;

the proportions of said components (i), and (ii) being such that the overall ratio of isocyanate groups to active hydrogen groups is in the range of 0.95:1 to about 1.05:1.

4,567,237

ETHYLENICALLY UNSATURATED POLYESTERS

Gilbert C. Johnson, Lino Lakes, and Heather V. Landin, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 21, 1984, Ser. No. 673,870
Int. Cl.[4] C08F 8/00; C08L 67/00
U.S. Cl. 525—170 16 Claims

1. Ethylenically unsaturated polyester comprising the reaction product of (a) a polyhydroxy polyester which is the addition or condensation product of a saturated or unsaturated dicarboxylic acid and an acyclic or carboxylic organic diepoxide, with (b) polymerizable ethylenically unsaturated compound having a functional group reactive with the hydroxyl groups of the polyhydroxy polyester, said ethylenically unsaturated polyesters having an equivalent weight of less than about 330 per ethylenic groups.

4,567,238

POLYAMIDE-RUBBER BLENDED COMPOSITION

Koji Sasaki, and Junji Koizumi, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 31, 1984, Ser. No. 666,673
Claims priority, application Japan, Oct. 31, 1983, 58-204502
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] C08F 8/00; C08L 31/00
U.S. Cl. 525—179 8 Claims

1. A polyamide-rubber blended composition having improved resistance to ozone, stress whitening and gasoline prepared by mixing together with heating the following components:

(a) from 70 to 20 volume percent of a rubber composition consisting of:

(i) 30 to 70 volume percent of an acrylonitrile-butadiene copolymer rubber containing at least 0.8 weight percent of an epoxy group in the polymer, and

(ii) 70 to 30 volume percent of an epichlorohydrin rubber;

(b) 30 to 80 volume percent of a polyamide resin; and

(c) at least 0.15 parts by weight of a carboxylic acid having a functional group calculated in terms of the weight of the carboxyl group per 100 parts by weight of the rubber composition of component (a).

4,567,239

COPOLYMERS OF TERMINALLY FUNCTIONAL POLYMERS

Paul A. Mancinelli, Aston, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 15, 1984, Ser. No. 620,974
Int. Cl.[4] C08L 257/02
U.S. Cl. 525—309 4 Claims

1. Copolymer formed by copolymerizing (a) from 1 to 95% by weight of a macromolecular monomer having the general formula

$$A\text{-}(Z)_n\text{-}(CH_2\underset{R}{CH}S)_x\text{-}R'$$

where A is the alkyl portion of an alkyllithium initiator, Z is a repeating monomeric unit of a monomer susceptible to anionic polymerizaton, n is a positive integer from 3 to 1500, R is either hydrogen, C_1–C_{10} alkyl, or phenyl, x is a positive integer of at least 1, and R' is a radical formed by removal of halogen from a halogenated compound containing a moiety polymerizable by free-radical, cationic, or anionic initiators and (b) 99 to 5% by weight of a monomer or monomers copolymerizable therewith by free-radical, cationic, or anionic initiation.

4,567,240

ETHYNYL TERMINATED ESTER OLIGOMERS AND POLYMERS THEREFROM

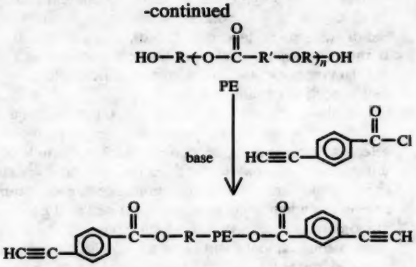
Paul M. Hergenrother, Yorktown, and Stephen J. Havens, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 23, 1984, Ser. No. 613,138
Int. Cl.[4] C08G 63/76
U.S. Cl. 525—328.1 14 Claims

1. An ethynyl terminated ester oligomer for producing a cured polymer having improved solvent resistance, higher use temperature and synthesized according to the general reaction

$$HO\text{-}R\text{-}OH + Cl\text{-}\overset{O}{\overset{\|}{C}}\text{-}R'\text{-}\overset{O}{\overset{\|}{C}}\text{-}Cl \xrightarrow{\text{base}}$$

-continued

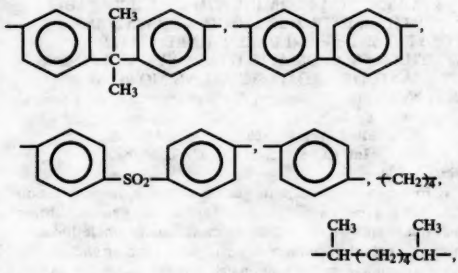


where

PE refers to the polyester radical portion,

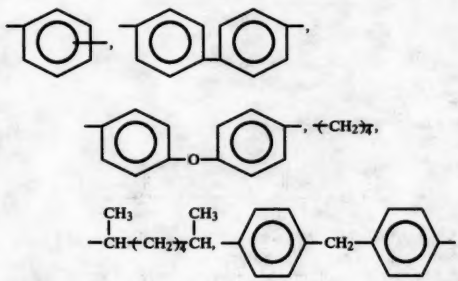
n is an integer and represents 4 to 100 repeat units, base refers to an organic base selected from the group consisting of triethylamine, pyridine, quinoline, diethylamine and piperidine,

R is selected from the group of radicals consisting of



and mixtures thereof, and

R' is selected from the group of radicals consisting of



and mixtures thereof.

4,567,241

MODIFICATION OF POLYMER SURFACES

John D. Kitchens, and Leo R. Novak, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 619,515, Jun. 11, 1984, abandoned. This application Mar. 20, 1985, Ser. No. 713,519

Int. Cl.⁴ C08F *8/32*

U.S. Cl. 525—352 **26 Claims**

1. A solid polymer having a surface portion and an interior portion such that the surface portion comprises thiocyanate or isothiocyanate functionality and the interior portion is substantially devoid of thiocyanate or isothiocyanate functionality wherein the thiocyanate functionality is incorporated into the polymer by addition to reactive unsaturation of the solid polymer.

4,567,242

FLAME RETARDER FOR ORGANIC HIGH MOLECULAR COMPOUNDS PREPARED FROM POLYCONDENSATES OF HALOGENATED PHENOLS

Setsuo Nishibori; Hirohito Komori, both of Kyoto; Syuji Saeki, Uji, and Hiromitsu Kinoshita, Osaka, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Mar. 30, 1983, Ser. No. 480,477

Claims priority, application Japan, Apr. 6, 1982, 57-57467

Int. Cl.⁴ C08G *65/48*

U.S. Cl. 525—534 **4 Claims**

1. A flame retarder for organic high molecular compounds which comprises a compound prepared by reacting a polycondensate of a halogenated phenol with a member selected from the group consisting of a metal compound and an organic compound, said metal compound and organic compound having at least two functional groups capable of reacting with the terminal hydroxyl group of said polycondensate.

4,567,243

POLYMERIZATION METHOD

Thomas J. Pullukat, Hoffman Estates, Ill.; Yu-Tang Hwang, Clinton, Iowa, and Robert A. Dombro, Palatine, Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 487,454, Apr. 21, 1983, Pat. No. 4,524,141. This application Oct. 29, 1984, Ser. No. 665,612

Int. Cl.⁴ C08F *4/02, 10/00*

U.S. Cl. 526—128 **13 Claims**

1. The method of making polymers from polymerizable 1-olefins which comprises polymerizing at least one of said olefins under polymerizing conditions with a catalyst system comprising an alkyl or aryl aluminum compound cocatalyst and a catalyst prepared by reacting:

(A) a support comprising

(1) silica, alumina, silica-alumina or mixtures of these having unreacted surface hydroxyl groups and dried or calcined at a temperature of about 200° C. to 1000° C., or

(2) silica, alumina, silica-alumina or mixtures of these having surface hydroxyl groups completely reacted with an excess of an organosilane which is reactive with said groups followed by removal of any excess of said organosilane and reaction by-products, with

(B) an excess relative to said unreacted or reacted hydroxyl groups of (A)(1) or (A)(2), respectively, of an organosilicon compound which is reactive with said hydroxyl groups of the formula $(R_3Si)_2NH$, where R is a hydrocarbyl group selected from C_1–C_{20} alkyls, aryls, alkaryls or aralkyls or mixtures of these in an amount equal to 0.2 to 2.0 molar equivalents to the organomagnesium compound or complex of (C); and

(C) an organomagnesium compound or a complex of said organomagnesium compound with a Group IIIA organometallic compound; followed by

(D) a halide or alkoxy halide of a transition metal selected from the group consisting of titanium, vanadium and zirconium.

4,567,244

RING OPENING POLYMERIZATION OF MONO-OLEFIN RING COMPOUNDS

Robert H. Grubbs, and Laura R. Gilliom, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 28, 1984, Ser. No. 594,354

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 526—160 **9 Claims**

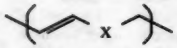
1. A method of polymerizing a monomer containing a

strained olefin within a cyclic group selected from compounds of the formula:

where X is $(CR_2)_y$, y is an integer from 1 to 2 and R is selected from H, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, or monocyclic aryl;

comprising the steps of mixing an excess of said monomer with Cp_2TiCH_2— where Cp is cyclopentadiene to form a titanacyclobutane complex of the formula:

heating the mixture to a temperature above the decomposition temperature of the complex and selectively opening said strained olefin ring to form a linear polymer containing repeating units of the formula:



4,567,245

SUBSTITUTED POLYACETYLENE COPOLYMER

Minoru Takamizawa; Akira Yamamoto, and Shigehiro Nagura, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,861

Claims priority, application Japan, Dec. 22, 1983, 58-243609

Int. Cl.[4] C08F 230/08, 238/00

U.S. Cl. 526—279 **2 Claims**

1. A substituted polyacetylene copolymer composed of two types of the recurring monomeric units, of which the first type of the monomeric units is expressed by the formula

$$-C(-Me)=C(-SiMe_3)-$$

and the second type of the monomeric units is expressed by the formula

$$-C(-Me)=C(-SiMe_2-CH_2-SiMe_3)-,$$

in which Me is a methyl group, the molar ratio of the first type of the monomeric units to the second type of the monomeric units being in the range from 30:70 to 95:5.

4,567,246

WATER-SWELLABLE CROSSLINKED POLYMERIC MICROGEL PARTICLES AND AQUEOUS DISPERSIONS OF ORGANIC FILM-FORMING RESINS CONTAINING THE SAME

Chandrasen Gajria, Louisville, Ky., and Yehuda Ozari, Arcadia, Calif., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 449,887, Dec. 16, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,476

Int. Cl.[4] C08F 22/02

U.S. Cl. 526—318.44 **8 Claims**

1. A polymeric microgel composition comprising discrete particles of crosslinked, aqueous emulsion polymerized copolymer comprising:

a. at least one polymerizable carboxylic acid group-free polymerizable vinyl monomer selected from the group consisting of polymerizable vinyl aromatic monomers, methacrylate ester monomers, nitrile monomers, vinyl halide monomers, mixtures thereof, and mixtures thereof with minor amounts of vinyl ester monomers and alkyl acrylate monomers in an amount of sufficient to provide a major portion of said copolymer;

b. from about 10 to 50%, based on the total monomer weight, of at least one polymerizable vinyl monomer selected from the group consisting of $\alpha\beta$-ethylenically unsaturated carboxylic acid monomers and mixtures thereof, said carboxylic acid monomers being substantially nongelling when copolymerized with said acid group-free monomers in an aqueous emulsion; and

c. from a small amount sufficient to crosslink the microgel particles up to about 5%, based on the total monomer weight, of a difunctional cross-linking monomer having at least two polymerizable double bonds;

said microgel particles being water-swellable and exhibiting a stability in aqueous media of at least one week when an aqueous dispersion of said microgel particles of about 20% solids content is maintained at 140° F.

4,567,247

PROCESS FOR FORMING THERMALLY STABLE THERMOTROPIC LIQUID CRYSTALLINE POLYESTERS OF PREDETERMINED CHAIN LENGTH UTILIZING AROMATIC HYDROXYL MONOMER AND/OR AROMATIC AMINE MONOMER

Hyun-Nam Yoon, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

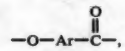
Filed May 17, 1984, Ser. No. 611,299

Int. Cl.[4] C08G 63/06, 63/60, 69/44

U.S. Cl. 528—190 **24 Claims**

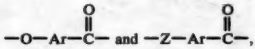
1. In a process for the formation within a polymerization zone of a polyester which is capable of forming an anisotropic melt phase and which optionally may include amide linkages through a polymerization reaction of ester-forming and optionally also amide-forming monomers to form a polymer having recurring moieties selected from the group consisting of the following where in each instance Ar may be the same or different and comprises at least one aromatic ring:

(a)



and

(b) a mixture of



where Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group;

the improvement of providing in the polymerization zone during the polymerization reaction an approximately 0.25 to 4 percent molar excess of an aromatic monomer selected from the group consisting of the following where in each instance Ar may be the same or different and comprises at least one aromatic ring:

(c) HO—Ar—OH, and/or an esterified derivative thereof,

(d) H_2N—Ar—NH_2, and/or an amidated derivative thereof,

(e) HO—Ar—NH_2, and/or an esterified and/or an amidated derivative thereof, and

(f) mixtures of the foregoing,

which during the polymerization reaction imparts units to the interior of the polymer chains selected from the group consisting of:

(g) dioxyaryl units,

(h) diaminoaryl units,

(i) oxyaminoaryl units, and
(j) mixtures of the foregoing,
and causes the polymer chains to end in groups selected from group consisting of:
(k) hydroxyl end groups and/or an esterified derivative thereof,
(l) amino end groups and/or an amidated derivative thereof, and
(m) mixtures of the foregoing,
wherein the polymer chains achieve a predetermined average chain length through the depletion of other monomers present in the polymerization zone to yield a polyester product which is substantially incapable of additional chain growth upon subsequent heating.

4,567,248

BRANCHED, HIGH MOLECULAR WEIGHT, THERMOPLASTIC POLYARYLENE ETHERS CONTAINING NITRILE GROUPS, AND THEIR PREPARATION

Gerd Blinne, Bobenheim; Herbert Bender, Boehl-Iggelheim, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,243

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345416

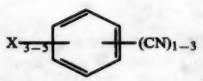
Int. Cl.[4] C08G *65/40*

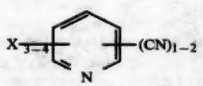
U.S. Cl. 528—211 **9 Claims**

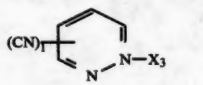
1. A branched, high molecular weight, thermoplastic polyarylene ether which contains nitrile groups and repeating units of the formula I

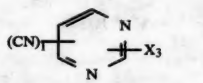
$$-E_1-O-E_2-O- \qquad \text{I}$$

where E_1 is a halogen-free residuum of a dihalobenzene compound and E_2 is a HO-free residuum from a bisphenol, and contains from 0.01 to 5 mol %, based on the radical E_1, of one or more halogen-free residuum of polyhalo compounds of the formulae


(II)


(III)


(IV)


(V)

(VI)

where X is fluorine or chlorine.

4,567,249

MELT PREPARATION OF POLYAMIDE BY AMIDE ESTER INTERCHANGE

Daniel W. Fox, and Sheldon J. Shafer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 18, 1983, Ser. No. 553,152

Int. Cl.[3] C08G *69/28*

U.S. Cl. 528—347 **10 Claims**

1. A process for the preparation of a polyamide by esteramide interchange, said process consisting of heating a mixture of at least one diaryl ester of a dicarboxylic acid having at least 6 carbon atoms and at least one diamine having at least 4 carbon atoms, at a temperature above the melting point of said polyamide until formation of said polyamide is substantially complete.

4,567,250

PREPARATION OF FINELY DIVIDED ELECTRICALLY CONDUCTIVE PYRROLE POLYMERS

Herbert Naarmann, Wattenheim; Walter Heckmann, Weinheim; Gernot Köhler, and Petr Simak, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,947

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325892

Int. Cl.[4] C08G *73/20*; H01B *1/12*; C07D *207/30*

U.S. Cl. 528—423 **3 Claims**

1. A process for the preparation of a finely divided electrically conductive pyrrole polymer, wherein monomers from the class consisting of the pyrroles, in solution and in the presence of a conductive salt, are treated with an oxygen-containing oxidizing agent at a temperature of 0°–100° C. and at a concentration of not less than 1 mole of conductive salt per 3 moles of monomer.

4,567,251

CATALYST PASSIVATION PROCESS

Jaroslav C. Balas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 392,834, Jun. 28, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 578,167

Int. Cl.[4] C08F *6/08, 8/04*

U.S. Cl. 528—487 **4 Claims**

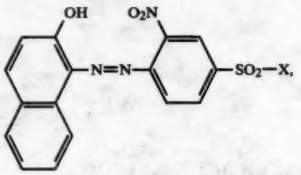
1. A method of treating solutions of hydrogenated polymers or copolymers of conjugated dienes, said solutions being contaminated with residues of nickel hydrogenation catalysts comprising nickel in the zero valence state, said method comprising:
(a) oxidizing said nickel residues to a higher valence state; and
(b) contacting the resulting oxidized nickel residues with a ligand selected from the group consisting of sodium dibutyldithiocarbamate, bis(O-ethyl(3,5 di-tert-butyl-4-hydroxybenzyl))phosphonic acid and potassium bis(O-ethyl(3,5 di-tert-butyl-4-hydroxybenzyl)phosphonate, which is capable of formng Ni chelates which are inert in redox reactions or are capable of catalyzing the decomposition of hydroperoxides only through nonradical-forming mechanisms.

4,567,252
WATER-INSOLUBLE NAPHTHOL MONOAZO DYESTUFF

Ulrich Bühler, Schöneck; Horst Tappe, Dietzenbach; Albert Bode, Schwalbach; Manfred Hähnke, Kelkheim, and Kurt Roth, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,240
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1982, 3221504
Int. Cl.[4] C09B *29/02, 29/34;* D06P *3/24, 3/52*
U.S. Cl. 534—882 4 Claims

1. Azo dyestuff of the formula



wherein

X is —NR^1R^2;

R^1 is hydrogen or alkyl having 1 to 10 carbon atoms which is unsubstituted or substituted by chloro, bromo, cyano, alkoxycarbonyl having 2 to 5 carbon atoms or phenyl;

R^2 is a polyether moiety of the formula

$$[AO]_m\text{-}[A']_n\text{-}R$$

wherein

A and A' independently of one another are linear or branched divalent, saturated hydrocarbyl moieties having 2 to 4 carbon atoms;

R is hydrogen, alkyl having 1 to 4 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, alkenyl having 3 to 5 carbon atoms, phenyl, substituted phenyl, benzyl, phenethyl, alkylcarbonyl having 1 to 4 carbon atoms or benzoyl, said substituted phenyl being substituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro or bromo;

m is a number from 1 to 5; and

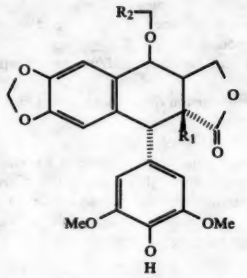
n is 0 or 1.

4,567,253
2-SUBSTITUTED DERIVATIVES OF PODOPHYLLOTOXIN AND ETOPOSIDE

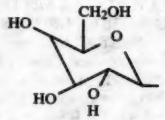
Tony Durst, 1956 Sharel Dr., Ottawa, Canada (K1H 6W2); Margaret B. Glinski-Oomen, 3-242 Charlotte St., Ottawa, Canada (K1N 8L3), and James C. Freed, 9 Centre St., Ovest, Aylmer, Canada (J9J 3A4)

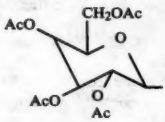
Filed Feb. 3, 1984, Ser. No. 576,981
Int. Cl.[4] C07H *15/20;* C07D *317/44*
U.S. Cl. 536—18.1 6 Claims

2. A 2-substituted Etoposides corresponding to the formula:

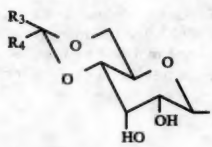


where R_1 is selected from the group consisting of halogen, lower alkyl, hydroxyl, and —SR_5 where R_5 is lower alkyl, and where R_2 is:





where AcO is acetyl; or



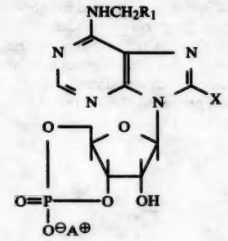
where R_3 is hydrogen and R_4 is alkyl, alkenyl, cycloalkyl, 2-furyl, 2-thienyl, aryl, or aralkyl, wherein the aromatic ring can be substituted by one or more hydroxyl, alkyl, alkoxy, nitro or halogen; or where R_3 and R_4 are both alkyl or where each of R_3 and R_4 taken together with the carbon atom to which they are attached signify a saturated cycloaliphatic ring having 5 or 6 carbon atoms; each alkyl, alkenyl or alkoxy above having no more than 10 carbon atoms and each aryl containing no more than 16 carbon atoms excluding substituents on the ring which are defined above.

4,567,254
METHOD FOR PREPARING N^6,8-DISUBSTITUTED 3',5'-CYCLIC ADENOSINE MONOPHOSPHATE AND SALT THEREOF

Shigehiro Kataoka; Takashi Nakamura; Nobuyuki Yamaji, all of Noda, and Seiichi Nasuno, Nagareyama, all of Japan, assignors to Kikkoman Corporation, Japan

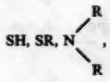
Filed Sep. 19, 1984, Ser. No. 652,093
Int. Cl.[4] C07H *15/12, 17/00*
U.S. Cl. 536—27 4 Claims

1. A method for preparing an N^6,8-disubstituted 3',5'-cyclic adenosine monophosphate or salt thereof represented by the general formula

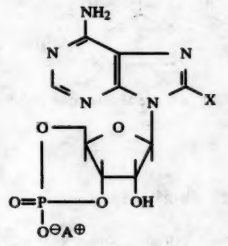


(I)

wherein X denotes a halogen atom, or



N_3, OH or OR, R being a methyl, ethyl, butyl, isobutyl, hexyl, octyl or benzyl group; $A^{\oplus}$ denotes a hydrogen ion, alkali metal ion, ammonium ion or organic ammonium ion; and R_1 denotes a methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl, isopentyl, hexyl, isohexyl, heptyl, octyl, nonyl, decyl, undecyl, tridecyl, phenyl, methylphenyl, hydroxiphenyl, methoxyphenyl, chlorophenyl or furyl group, which method comprises reacting 8-substituted 3',5'-cyclic adenosine monophosphate or salt thereof represented by the general formula (II)

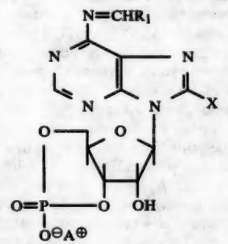


(II)

wherein X and $A^{\oplus}$ are as defined above, with an aldehyde represented by the general formula

$$R_1\text{—CHO} \qquad \text{(III)}$$

wherein R_1 is as defined above, in a solvent at a pH of 7.0 or less and at a temperature of −20° to 120° C., the molar ratio of (II) to (III) being in the range of 1:2 to 1:40 to form an imine compound represented by the general formula



(IV)

wherein X, R_1 and $A^{\oplus}$ are as defined above, as an intermediate, and reducing the imine compound in the presence of a metal hydride, nascient hydrogen or a catalyst of nickel, iron, platinum or palladium at a temperature in the range of −20° to 120° C., said reaction of the compound of the general formula (II) with the aldehyde of the general formula (III) to form the imine compound of formula (IV) and said reduction thereof to the compound of the general formula (I) being conducted for a period of time between about 1 to 200 hours.

4,567,255

METHOD OF PRODUCING CELLULOSE CARBAMATE

Vidar Eklund; Kurt Ekman; Olli Turunen; Jouko Huttunen, all of Porvoo; Johan-Fredrik Selin, Helsinki, and Jan Fors, Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Mar. 12, 1985, Ser. No. 710,689

Claims priority, application Finland, Mar. 12, 1984, 840999

Int. Cl.[4] C08B *15/06*

U.S. Cl. 536—30 **14 Claims**

1. In the method for the manufacture of cellulose carbamate by the reaction of isocyanic acid with cellulose at elevated temperatures, the improvement which comprising heating at a temperature of at least 170° C. cellulose in contact with biuret in an amount sufficient to produce isocyanic acid in an adequate amount to react with cellulose to form cellulose carbamate, said heating being continued until said adequate amount of isocyanic acid is formed.

4,567,256

AMIDINE PROCESS

Dolatrai M. Vyas; Takushi Kaneko, and Terrence W. Doyle, all of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

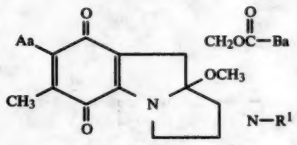
Division of Ser. No. 492,903, May 9, 1983, Pat. No. 4,487,769, which is a continuation-in-part of Ser. No. 385,149, Jun. 4, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 658,236

Int. Cl.[4] C07D *403/04*

U.S. Cl. 544—58.2 **9 Claims**

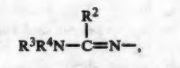
1. The process for preparing a compound of formula Ia

Formula Ia



wherein:

Aa is amino, methoxy, hydroxy, or the amidino group of the formula



Ba is the said amidino group,

R^1 is hydrogen, lower alkyl, lower alkanoyl, benzoyl or substituted benzoyl wherein said substituent is lower alkyl, lower alkoxy, halo, amino, or nitro,

R^2 is hydrogen, lower alkyl, phenyl, lower alkylphenyl, lower alkoxyphenyl, halophenyl, aminophenyl, nitrophenyl, thienyl, furyl, cyano, dilower alkylamino, lower alkoxy, or lower alkylthio,

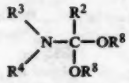
R^3 is lower alkyl or lower alkoxy,

R^4 is lower alkyl, or

R^3 and R^4 together with the nitrogen atom to which they are attached constitutes pyrrolidine, 2-, or 3-lower alkylpyrrolidine, piperidine, 2-, 3-, or 4-lower alkylpiperidine, 2,6-dilower alkylpiperidine, piperazine, 4-substituted piperazine (wherein said 4-substituent is alkyl, or carbalkoxy each having 1 to 8 carbon atoms, phenyl, methylphenyl, methoxyphenyl, halophenyl, nitrophenyl, or benzyl),

azepine, 2-, 3-, 4-, or 5-lower alkylazepine, morpholine, thiomorpholine, thiomorpholine-1-oxide, or thiomorpholine-1,1-dioxide,

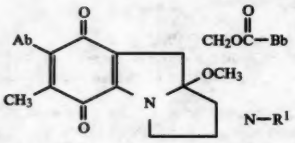
wherein each of the aforesaid lower alkyl, lower alkanoyl and lower alkoxy groups contains 1 to 6 carbon atoms which comprises reacting a compound selected from the group consisting of mitomycin C 7-hydroxy-9a-methoxymitosane, mitomycin A, or an N^{1a}-R^1-substituted derivative thereof with an amide acetal of the formula



wherein R^2, R^3, and R^4 are as defined above and each R^8 is independently lower alkyl, or cycloalkyl having up to 6 carbon atoms or together they are alkylene forming with the attached oxygen atoms and intervening carbon atom a cyclic structure having 5 or 6 ring members in solution in an anhydrous reaction compatible liquid organic reaction medium at 40° C. to 65° C. until a reaction product is formed in which Ba or both Aa and Ba are the said amidino group.

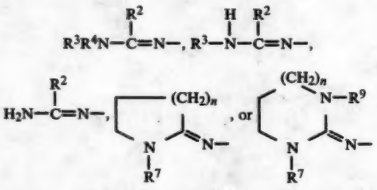
6. The process for preparing a compound of Formula Ib

Formula Ib



wherein:

Ab is (1-lower alkyl-2(1H)-pyridinylidene)amino, or a group of the formula



Bb is amino,

n is the integer of 0, 1, 2, or 3,

R^1 is hydrogen, lower alkyl, lower alkanoyl, benzoyl or substituted benzoyl wherein said substituent is lower alkyl, lower alkoxy, halo, amino, or nitro,

R^2 is hydrogen, lower alkyl, phenyl, lower alkylphenyl, lower alkoxyphenyl, halophenyl, aminophenyl, nitrophenyl, thienyl, furyl, cyano, dilower alkylamino, lower alkoxy, or lower alkylthio,

R^3 is lower alkyl or lower alkoxy,

R^4 is lower alkyl, or

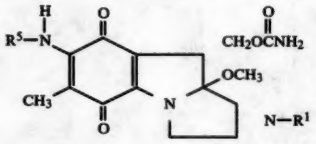
R^3 and R^4 together with the nitrogen atom to which they are attached constitutes pyrrolidine, 2-, or 3-lower alkylpyrrolidine, piperidine, 2-, 3-, or 4-lower alkylpiperidine, 2,6-dilower alkylpiperidine, piperazine, 4-substituted piperazine (wherein said 4-substituent is alkyl, or carbalkoxy each having 1 to 8 carbon atoms, phenyl, methylphenyl, methoxyphenyl, halophenyl, nitrophenyl, or benzyl), azepine, 2-, 3-, 4-, or 5-lower alkylazepine, morpholine, thiomorpholine, thiomorpholine-1-oxide, or thiomorpholine-1-dioxide,

R^7 and R^9 are independently H or lower alkyl

wherein each of the aforesaid lower alkyl, lower alkanoyl and lower alkoxy groups contains 1 to 6 carbon atoms which comprises reacting a dimethylformamide (or other compatible solvent) solution of N^{1a}-R^1-substituted mitomycin C with from 1.0 to 1.5 molecular proportions of sodium hydride thereby producing an anionic form thereof and reacting said anionic form with an iminoether, an iminothioether, a halomethyleniminium halide, or an iminohalide salt.

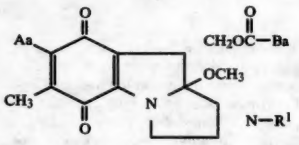
7. The process for preparing 7-substituted amino-9a-methoxymitosane of formula III

Formula III

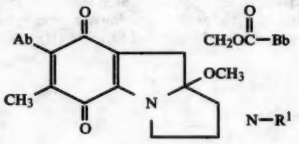


which comprises reacting a compound of Formula Ia or Ib

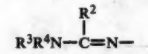
Formula Ia



Formula Ib



wherein Aa, Ba, and Ab are the said amidino group of the formula



and Bb is $—NH_2$ with a primary amine of the formula R^5NH_2 in an anhydrous reaction compatible liquid organic reaction medium at a temperature of from about −15° C. to +50° C. wherein R^5 in the foregoing formulas is the primary amino group attached substituent of an aliphatic, alicyclic, aromatic, heteroaromatic, or heteroalicyclic primary amine in which the carbon atom bearing the amino group bears at least one hydrogen atom and less than two aryl groups and is further characterized by the absence of functional substituents which are incompatible with the reaction conditions, and wherein:

R^1 is hydrogen, lower alkyl, lower alkanoyl, benzoyl or substituted benzoyl wherein said substituent is lower alkyl, lower alkoxy, halo, amino, or nitro,

R^2 is hydrogen, lower alkyl, phenyl, lower alkylphenyl, lower alkoxyphenyl, halophenyl, aminophenyl, nitrophenyl, thienyl, furyl, cyano, dilower alkylamino, lower alkoxy, or lower alkylthio,

R^3 is lower alkyl or lower alkoxy,

R^4 is lower alkyl, or

R^3 and R^4 together with the nitrogen atom to which they are attached constitute pyrrolidine, 2-, or 3-lower alkylpyrrolidine, piperidine, 2-, 3-, or 4-lower alkylpiperidine, 2,6-dilower alkylpiperidine, piperazine, 4-substituted piperazine (wherein said 4-substitutent is alkyl, or carbalkoxy each having 1 to 8 carbon atoms, phenyl, methylphenyl, methoxyphenyl, halophenyl, nitrophenyl, or benzyl), azepine, 2-, 3-, 4-, or 5-lower alkylazepine, morpholine, thiomorpholine, thiomorpholine-1-oxide, or thiomorpholine-1,1dioxide.

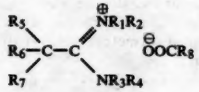
4,567,257

AMIDINIUM SALTS

Dale F. Regelman, Wallingford, Conn., assignor to The Upjohn Company, Midland, Mich.

Filed Jan. 16, 1984, Ser. No. 571,391
Int. Cl.[4] C07C *123/00*; C07D *295/12*
U.S. Cl. 544—78 12 Claims

1. An amidinium salt having the formula



wherein R_1, R_2, R_3, and R_4, when taken individually, are independently selected from the group consisting of loweralkyl, aralkyl, cycloalkyl, and, when taken together with the respective nitrogen atoms to which they are attached R_1 together with R_2 and R_3 together with R_4 independently represent heterocyclic groups having 5 to 7 ring atoms, and R_5, R_6, R_7, and R_8 are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl.

4,567,258

PROCESS AND APPARATUS FOR PRODUCING CYANURIC ACID

William B. Dodge, Montgomery Township, Somerset County, N.J., assignor to Olin Corporation, Cheshire, Conn.

Filed Apr. 18, 1985, Ser. No. 724,730
Int. Cl.[4] C07D *251/32*
U.S. Cl. 544—192 26 Claims

1. A process for the production of cyanuric acid as a solution or slurry in an inert organic solvent by the pyrolysis of a compound selected from the group consisting of urea and/or biuret, said compound being dissolved as an aqueous solution comprising the steps of combining the aqueous solution of the compound with an inert organic solvent to form a combined solution of the compound in a mixed water and inert organic solvent, stripping water from the combined solution as it flows in one direction by contacting the combined solution with a countercurrent flow of vapors of the inert organic solvent thereby providing a solution of the compound in the solvent and a mixed water-inert organic solvent vapor flowing from and countercurrent to said solvent solution of the compound, rectifying the mixed water-inert organic solvent vapor by contacting the same with a countercurrent flow of aqueous reflux to thereby condense substantially all of the inert organic solvent and to provide a flow of aqueous vapors substantially free of the inert organic solvent, condensing said aqueous vapors and introducing a portion thereof as said reflux, heating at least a portion of the solvent solution of the compound to provide said flow of vapors of inert organic solvent countercurrent to and necessary for stripping the water from the combined solution, and maintaining the temperature of the solvent solution of the compound at not less than 180° C. to provide a solution or slurry comprised of cyanuric acid in inert organic solvent.

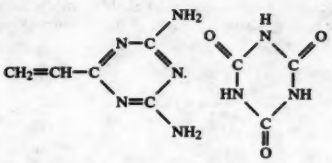
4,567,259

ISOCYANURIC ACID ADDUCT OF 2-VINYL-4,6-DIAMINO-S-TRIAZINE

Natsuo Sawa, Nakatado; Takeshi Masuda, Marugame, and Takashi Mizui, Kawagoe, all of Japan, assignors to Shikoku Chemicals Corp., Kagawa, Japan

Filed Jan. 25, 1985, Ser. No. 694,958
Claims priority, application Japan, Jan. 26, 1984, 59-13121
Int. Cl.[4] C07D *403/12*
U.S. Cl. 544—207 4 Claims

1. An isocyanuric acid adduct of 2-vinyl-4,6-diamino-S-triazine represented by the following structural formula:



4,567,260

SYNTHESIS OF 5-DEAZARIBOFLAVINE

Fumio Yoneda, Kumamoto, Japan, assignor to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 30, 1983, Ser. No. 509,764
Claims priority, application Japan, Jul. 1, 1982, 57-115175
Int. Cl.[4] C07D *471/04*, *239/54*
U.S. Cl. 544—250 12 Claims

1. A process for synthesizing 5-deazariboflavine comprising condensing 6-chloro 5-formyluracil with N-D-ribityl-3,4-xylidine in one step reaction in an organic solvent at a temperature at or below the boiling point of said solvent yielding greater than 80% of said 5-deazariboflavine.

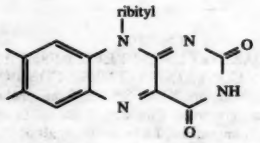
4,567,261

PREPARATION OF RIBOFLAVIN

Hansgeorg Ernst, Ludwigshafen; Wolfram Schmidt, Friedelsheim, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

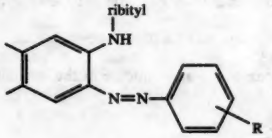
Filed Jan. 13, 1984, Ser. No. 570,457
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302497
Int. Cl.[4] C07D *475/14*
U.S. Cl. 544—251 7 Claims

1. An improved process for the preparation of riboflavin of the formula I



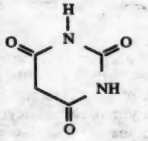
(I)

by condensing a 4,5-dimethyl-N-(D)-ribityl-2-phenylazoaniline of the formula II



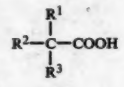
(II)

where R is H or —Cl, —NO_2 or —CH_3 in the o- or p-position, with barbituric acid of the formula III



(III)

in the presence of an acid as a condensing agent, wherein the acidic condensing agent used is an aliphatic or cycloaliphatic-/aliphatic tertiary carboxylic acid of the formula IV



(IV)

where R^1, R^2 and R^3 are each a lower alkyl group, R^1, R^2 and R^3 together containing 3 to 20, carbon atoms, and R^2 and R^3 together form a tetramethylene or pentamethylene group.

4,567,262

PURIFICATION OF RIBOFLAVIN

Johannes Grimmer, Grehaa, Denmark, and Hans C. Horn, Lambsheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,467

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247381

Int. Cl.⁴ C07D *475/14*

U.S. Cl. 544—251 **5 Claims**

1. An improved process for the purification of crude riboflavin which has been prepared by condensation of an N-(D)-ribityl-2-arylazo-4,5-dimethylaniline and barbituric acid or another N-(D)-ribityl-4,5-dimethylaniline derivative with a barbituric acid derivative, by dissolving the crude riboflavin in sulfuric acid or phosphoric acid which has been diluted with water and oxidizing the impurities by treating the solution with hydrogen peroxide, or by dissolving the riboflavin in dilute nitric acid at elevated temperature and then isolating the pure riboflavin by precipitation with water, wherein the mineral acid solution of the riboflavin and the oxidizing agent, or the solution of the riboflavin in 20 to 70% strength by weight nitric acid, is heated extremely rapidly to a temperature at which the solution clearly changes color from greenish to yellow-orange, the solution is kept at this temperature for from 1 to 100 seconds and the oxidation reaction is then interrupted by addition of water.

4,567,263

7-AMINOAZOLO[1,5-A]-PYRIMIDINES AND FUNGICIDES CONTAINING THESE COMPOUNDS

Karl Eicken, Wachenheim; Klaus Scheib, Schauernheim; Hans Theobald; Ernst-Heinrich Pommer, both of Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

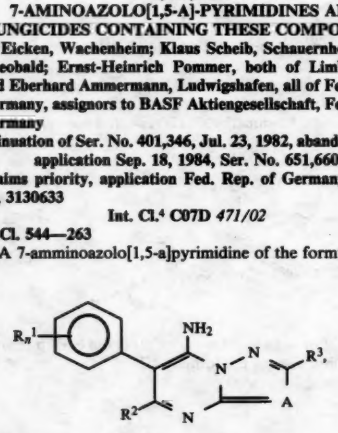
Continuation of Ser. No. 401,346, Jul. 23, 1982, abandoned. This application Sep. 18, 1984, Ser. No. 651,660

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130633

Int. Cl.⁴ C07D *471/02*

U.S. Cl. 544—263 **8 Claims**

1. A 7-amminoazolo[1,5-a]pyrimidine of the formula



I

where R^1 is unsubstituted alkyl of 1–12 carbons, halogen-substituted or alkoxy of 1–4 carbons-substituted alkyl of 1–12 carbons, halogen, alkoxy of 1–12 carbons, cyano, or cycloalkyl, or is phenyloxy, phenylthio, phenylalkyl, phenylalkoxy or phenylalkylthio wherein the alkyl is 1–6 carbons, each of which may be substituted by alkyl of 1–4 carbons, alkoxy of 1–4 carbons, halogen or cyano or is phenyl which is substituted by alkyl of 1–4 carbons, alkoxy of 1–4 carbons, halogen or cyano and each of which is fused to the phenyl ring n is 1 or n is 2 when two substituents are in the 2,4- and 3,4 positions, R^2 and R^3 are each hydrogen, alkyl of 1–4 carbons or phenyl, and A is nitrogen or a CR^4 group, where R^4 has the meanings of R^2 and halogen, cyano or alkoxy-carbonyl, or together with R^3 is alkylene which may have up to two double bonds.

5. A 7-aminoazolo[1,5-a]pyrimidine as defined in claim 1, where R^2 is hydrogen or methyl, R^3 is hydrogen or methyl, and R^4 is hydrogen.

4,567,264

CARDIOSELECTIVE ARYLOXY- AND ARYLTHIO-HYDROXYPROPYLENE-PIPERAZINYL ACETANILIDES WHICH AFFECT CALCIUM ENTRY

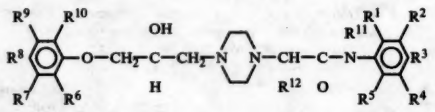
Arthur F. Kluge, Los Altos; Robin D. Clark, Palo Alto; Arthur M. Strosberg, Menlo Park, all of Calif.; Jean-Claude G. Pascal, Cachan, France, and Roger Whiting, Edinburgh, Scotland, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 18, 1983, Ser. No. 495,904

Int. Cl.⁴ C07D *241/04*; A61K *31/495*

U.S. Cl. 544—400 **3 Claims**

1. A compound of the formula:

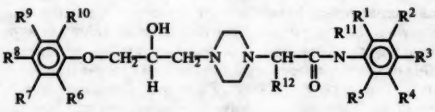


and the pharameutically acceptable esters and acid addition salts thereof, wherein:

R1 and R5 are each methyl

R^2 and R^3 and R^4 are each hydrogen and R^6 to R^{12} are each hydrogen, i.e., 1-[3-phenoxy-2-hydroxypropyl]-4-[2,6-dimethylphenyl)-aminocarbonylmethyl]-piperazine, and the pharaceutically acceptable esters and acid addition salts thereof.

2. A compound of the formula:

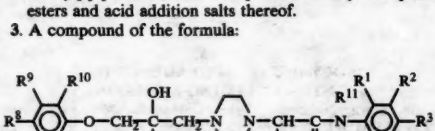


and the pharmaceutically acceptable esters and acid addition salts thereof, wherein:

R^1 and R^5 are each methyl

R^2, R^3, and R^4 are each hydrogen, R^6 is methoxy and R^7 to R^{12} are each hydrogen, i.e., 1-[3-(2-methoxyphenoxy)-2-hydroxypropyl]-4-[(2,6,-dimethylphenyl)-aminocarbonyl-methyl]-piperazine, and the pharaceutically acceptable esters and acid addition salts thereof.

3. A compound of the formula:



and the pharmaceutically acceptable esters and acid addition salts thereof, wherein:

R^1 and R^5 are each methyl;

R^2, R^3, and R^4 are each hydrogen, R^6 is cyano and R^7 to R^{12}

are each hydrogen, i.e., 1-[3-(2-cyanohenoxy)-2-hydroxypropyl]-4-[2,6-dimethylphenyl)aminocarbonylmethyl]piperazine.

4,567,265

CYCLOPROPANOID CYANOESTERS AND METHOD OF MAKING SAME

James H. Babler, Evanston, Ill., assignor to Loyola University of Chicago, Chicago, Ill.

Filed Jan. 16, 1984, Ser. No. 570,874

Int. Cl.[4] C07C *120/00, 121/46;* **C07D** *213/127, 211/26*

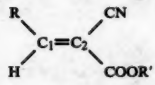
U.S. Cl. 546—16 **9 Claims**

1. A process for synthesis of a cyclopropanoid cyanoester comprising the following steps:

(A) forming a reaction mixture in a C_1 through C_4 monohydric alcohol solvent of

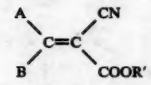
(i) 2-nitropropane,

(ii) a cyanoester selected from the group consisting of



(a)

and



(b)

wherein R' is methyl or ethyl, A, B represents a group having the formula $—(CH_2)_n—$ or $—(CH_2)_2—Y—(CH_2)_2—$, n=3, 4, or 5, Y being NCH_3, O, or S, and R can be selected from the class consisting of:

(1) alkyl, haloalkyl, alkenyl, haloalkenyl, cycloalkyl, carboalkoxy, and cycloalkenyl groups having up to ten carbons;

(2) a heterocyclic residue selected from the group consisting of furan, thiophene, pyridine, pyrrole and indole;

(3) phenyl and naphthyl groups; and,

(4) monosubstituted phenyl groups and disubstituted phenyl groups wherein the substituents are selected from the group consisting of alkyl, halogen, nitro, alkoxy, and haloalkyl;

provided that when R is alkenyl, R is not conjugated with the double bond between C_1 and C_2 and when R is a substituted phenyl group, at least one of the ortho carbons of said phenyl group is bonded to hydrogen; and

(iii) a base selected from the group consisting of alkali metal alkoxides and alkali metal carbonates;

(B) heating said reaction mixture in refluxing alcohol solvent; and

(C) isolating a cyclopropanoid cyanoester from said reaction mixture.

4,567,266

METHOD OF PREPARING OCTAHYDRO-1H(AND 2H)-PYRAZOLO[3,4-G]QUINOLINES

John M. Schaus, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

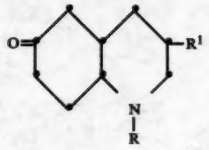
Continuation-in-part of Ser. No. 438,834, Nov. 3, 1982, abandoned. This application Aug. 2, 1984, Ser. No. 636,959

Int. Cl.[4] C07D *487/04*

U.S. Cl. 546—82 **8 Claims**

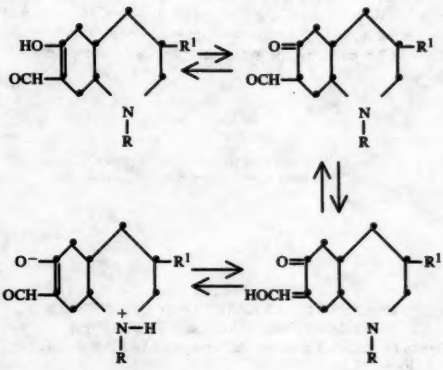
1. The method which comprises

(a) reacting a trans-dl-6-oxodecahydroquinoline of the formula



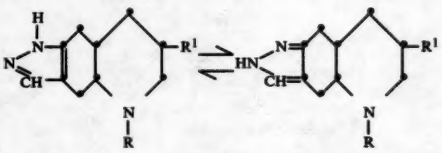
wherein R is C_{1-3} straight chain alkyl, allyl or benzyl, R^1 is H or COOZ and Z is C_{1-2} alkyl or phenyl-substituted C_{1-2} alkyl

with a lower alkyl formate in the presence of base in a mutual anhydrous solvent to yield a 7-formyl derivative of the tautomeric formulas substantially free of 5-formyl isomer



wherein R and R^1 have their previous significance and then

(b) reacting said α-formyl ketone with hydrazine in aqueous media to yield a mixture of tautomers of the formula



wherein R and R^1 have their previous significance.

4,567,267

α-PHENYL-2-(AZA)BENZOTHIAZOLYLTHIO-GLYCOLIC ACIDS AND DERIVATIVES THEREOF

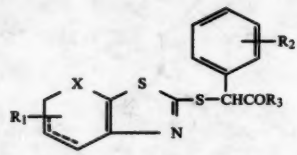
Peter H. L. Wei, Springfield, and Francis J. Gregory, Berwyn, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 273,826, Jun. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 130,483, Mar. 31, 1980, Pat. No. 4,275,065, which is a continuation-in-part of Ser. No. 50,847, Jun. 21, 1979, abandoned. This application Aug. 30, 1982, Ser. No. 413,275

Int. Cl.[4] C07D *513/04, 417/12, 277/74*

U.S. Cl. 546—114 **24 Claims**

1. A compound having the formula:



wherein R_1 is hydrogen, halo, nitro, amino, lower alkyl, lower alkoxy, trifluoromethyl or hydroxy; R_2 is hydrogen, fluorine, chlorine, bromine, lower alkyl, lower alkoxy amino, nitro, or trifluoromethyl; R_3 is hydroxy, lower alkoxy, amino, (lower-)alkylamino, hydroxy(lower)alkyl amino, N-(lower)alkanoylamino(lower)alkoxy, N-arylcarbamoyl(lower)alkylthio, N,N-di(lower)alkylamino-N'-(lower)alkylamino, (lower)alkyl-N-(lower)alkanoylamino, cyano(lower)alkylamino, prolino, cysteino or piperidino(lower)alkylamino; X is CH or N, and where the dotted lines represent optional double bonds in the 5,6- and 7,8 positions, or a pharmacologically acceptable salt thereof.

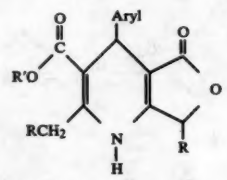
4,567,268

PROCESS FOR PREPARATION OF CERTAIN TETRAHYDROFURO[3,4-B]PYRIDINES

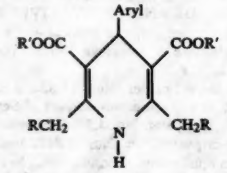
Steven D. Young, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 3, 1984, Ser. No. 596,333
Int. Cl.[4] C07D *491/048*
U.S. Cl. 546—116 **6 Claims**

1. A process for preparing a tetrahydrofuro[3,4-b]pyridine compound having the formula



wherein R is hydrogen or methyl and R' is a residue of a hydroxy compound capable of forming esters with a carboxyl group, comprising reacting a 1,4-dihydropyridine diester compound having the formula



wherein R and R' are as above defined with a bromine generating agent in a dry inert dispersion medium.

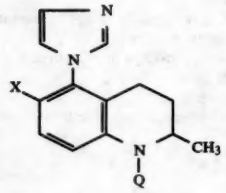
4,567,269

INTERMEDIATES FOR THE PREPARATION OF 6,7-DIHYDRO-8-(IMIDAZOL-1-YL)-5-METHYL-1-OXO-1H,5H-BENZO[IJ]QUINOLIZINE-2-CARBOXYLIC ACIDS

John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

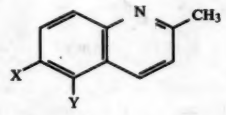
Division of Ser. No. 441,246, Nov. 12, 1982, Pat. No. 4,472,406.
This application Jun. 25, 1984, Ser. No. 624,407
Int. Cl.[4] C07D *215/04, 215/58*
U.S. Cl. 546—167 **2 Claims**

1. A compound of the formula

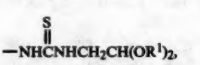


wherein X is hydrogen or halogen; and Q is hydrogen or $-CH{=}C(CO_2CH_2CH_3)_2$.

2. A compound of the formula



wherein X is hydrogen or halogen; and Y is imidazol-1-yl, 2-mercaptoimidazol-1-yl, $-N{=}C{=}S$ or,



wherein each R^1 is independently an alkyl group containing 1 to about 4 carbons.

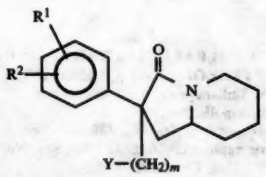
4,567,270

HEXAHYDROINDOLIZINONES USEFUL FOR TREATING CARDIAC ARRHYTHMIA, THROMBOTIC DISORDERS IN MAMMALS

Robert J. Chorvat, Arlington Heights; Kathleen A. Prodan, Buffalo Grove, and John A. Schulz, Lindenhurst, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Sep. 17, 1984, Ser. No. 651,210
Int. Cl.[4] C07D *487/00*; A61K *31/435*
U.S. Cl. 546—183 **19 Claims**

1. A compound of the formula:



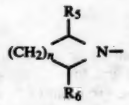
I

wherein R^1 and R^2, each being the same or different, are:

(a) hydrogen;

(b) halogen;

(c) alkyl of 1 to 6 carbon atoms, inclusive;
(d) alkoxy of 1 to 6 carbon atoms, inclusive; or
(e) phenyl;
wherein Y is:
(a) R^3R^4N—; or
(b) a group of the formula



wherein R^3 and R^4, each being the same or different, are alkyl of 1 to 6 carbon atoms, inclusive; wherein R^5 and R^6, each being the same or different, are alkyl of 1 to 3 carbon atoms, inclusive; wherein m is an integer from 2 to 6, inclusive; wherein n is an integer from 2 to 4, inclusive; and the racemic mixtures and isomers thereof; and the pharmaceutically acceptable acid addition salts thereof.

12. A method for treating cardiac arrhythmias in mammals comprising administering a therapeutically effective amount of at least one compound of claim 1 to a mammal in need of such treatment.

16. A method for treating thrombotic disorders in mammals comprising administering a therapeutically effective amount of at least one compound of claim 1 to a mammal in need of such treatment.

4,567,271
BENZOXADIAZOLES AND BENZOTHIADIAZOLES

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

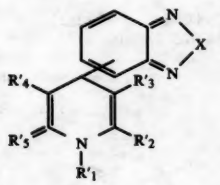
Division of Ser. No. 359,751, Mar. 19, 1982, Pat. No. 4,466,972, which is a continuation of Ser. No. 173,305, Jul. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 101,591, Dec. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 915,858, Jun. 15, 1978, abandoned. This application May 29, 1984, Ser. No. 614,650

Claims priority, application Switzerland, Jun. 20, 1977, 7520/77

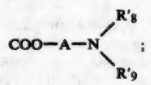
Int. Cl.[4] A61K *31/44*; C07D *513/00*

U.S. Cl. 546—271 4 Claims

1. A compound having the formula



wherein
R_1' is hydrogen or C_{1-6} alkyl;
R_2' and R_5', independently, are hydrogen or C_{1-6} alkyl;
R_3' and R_4', independently, are $COOR_7'$ or



each R_7', independently, is C_{1-6} alkyl, C_{3-7}cycloalkyl, C_{7-10} phenylalkyl, C_{3-6} alkoxyalkyl, C_{2-6}-hydroxyalkyl or C_{4-8} hydroxyalkoxyalkyl;
A is C_{1-6} alkylene;
each R_8' and R_9', independently, is C_{1-6} alkyl or C_{7-10} phenylalkyl; and
X is oxygen or sulphur, with the proviso that at least one of R_3' and R_4' is $COOR_7'$
where R_7' is C_{2-6} hydroxyalkyl or C_{4-8}hydroxyalkoxyalkyl, or a pharmaceutically acceptable acid addition salt of a basic compound of the above formula.

4,567,272
PYRROLE CONTAINING 2-AMINONITROPYRIDINE DERIVATIVES

Winfried Orth, Hassloch/Pfalz, and Werner Fickert, Mannheim, both of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

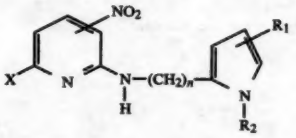
Filed Sep. 11, 1984, Ser. No. 649,336

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334029

Int. Cl.[4] C07D *401/12, 213/74, 213/61*

U.S. Cl. 546—281 4 Claims

1. A nitropyridine derivative represented by the structural formula:



in which
the nitro group is in the 3- or 5-position and X represents hydrogen, an alkoxy group with 1 to 3 C atoms or an unsubstituted or alkyl- or hydroxyalkyl substituted amino group, the alkyl portion of which has 1 to 3 C atoms,
R_1 and R_2 may be the same or different and represent hydrogen or a methyl-group and
n is 0, 1, 2 or 3.

4,567,273
LIQUID PHASE HALOGEN EXCHANGE OF (TRICHLOROMETHYL) PYRIDINES TO (TRIFLUOROMETHYL)PYRIDINES

Alexander P. Fung, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 369,051, Apr. 16, 1982, abandoned. This application Mar. 14, 1984, Ser. No. 589,433

Int. Cl.[4] C07D *213/26*

U.S. Cl. 546—345 19 Claims

1. A method of preparing a (trifluoromethyl)pyridine compound in a highly selective manner which comprises contacting in the liquid phase a (trichloromethyl)pyridine compound with a stoichiometric amount of HgF_2, Hg_2F_2, AgF or AgF_2 in the presence of from about 4 to about 18 molar equivalents of hydrogen fluoride per molar equivalent of (trichloromethyl)pyridine compound at a temperature of from −20° C. to 50° C.

4,567,274
CHLORINE EXCHANGE FOR FLUORINE IN 2-FLUOROPYRIDINE COMPOUNDS

Janice E. Gatlin, Antioch; Mark A. Van Dort, Pleasant Hill; Charles A. Wilson, Pittsburg, and Alexander P. Fung, Martinez, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1984, Ser. No. 675,036

Int. Cl.[4] C07D *211/72*

U.S. Cl. 546—345 10 Claims

1. A method of exchanging a chlorine atom for a fluorine atom at the 2-position of a 2-fluoropyridine compound which comprises contacting a 2-fluoropyridine compound with a

halosubstituted or unsubstituted trichloromethyl or dichlorofluoromethyl alpha, beta or gamma picoline compound in liquid phase at a temperature of 50°–250° C. and a pressure of atmospheric to about 100 psig.

4,567,275

CEPHEM AND CEPHAM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

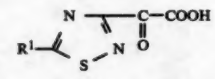
Division of Ser. No. 325,027, Nov. 25, 1981, Pat. No. 4,468,515, which is a division of Ser. No. 116,984, Jan. 20, 1980, Pat. No. 4,332,798, which is a continuation-in-part of Ser. No. 108,161, Dec. 28, 1979, abandoned. This application Jun. 12, 1984, Ser. No. 619,981

Claims priority, application United Kingdom, Dec. 29, 1978, 7850334; Oct. 12, 1979, 7935538; Denmark, Dec. 21, 1979, 5542/79

Int. Cl.⁴ C07D *285/08*

U.S. Cl. 548—128 **1 Claim**

1. A compound of the formula:



wherein R^1 is amino or a protected amino, and salts thereof.

4,567,276

β-ADRENERGIC 2-[4-(3-AMINO-2-HYDROXYPROPOXY)PHENYL-]IMIDAZOLES

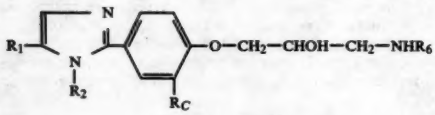
John J. Baldwin, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 255,202, Apr. 20, 1981, Pat. No. 4,440,774, which is a continuation-in-part of Ser. No. 184,501, Sep. 5, 1980, abandoned, which is a continuation of Ser. No. 801,120, May 27, 1977, abandoned, which is a continuation of Ser. No. 641,420, Dec. 17, 1975, Pat. No. 4,134,983, which is a continuation-in-part of Ser. No. 554,372, Mar. 3, 1975, abandoned. This application Jun. 13, 1983, Ser. No. 503,923

Int. Cl.⁴ C07D *233/64, 233/68, 233/90, 401/04*

U.S. Cl. 548—343 **15 Claims**

1. A compound having the formula:



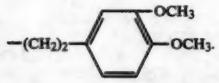
wherein

R_1 *L is H, CH₃*, tert.butyl or isopropyl,

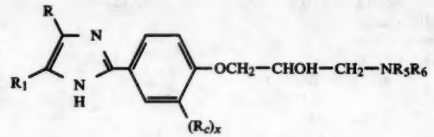
R_2 is H or CH_3

R_c is H, halo or OCH_3 and

R_6 is



5. A compound having the formula:



wherein R is hydrogen or an aromatic heterocyclic group selected from quinoline and those having 5–6 ring atoms, one to two of which is the hetero atom O, S, or N which heterocyclic group may be substituted on the carbon with 1 to 3 substituents selected from halo and lower alkyl and when the hetero atom is nitrogen may be substituted on the nitrogen with oxygen; R_c is selected from halogen, C_1–C_4 linear or branched alkyl, C_3–C_4 cycloalkyl, C_1–C_4 alkoxy, hydroxy or cyano; R_5 is H; R_6 is C_1–C_6 linear, branched, or cyclic alkyl or substituted C_1–C_6 linear or branched alkyl wherein said substitutent is phenyl or lower alkoxy-substituted phenyl, x=0 or 1; and R_1 is phenyl or substituted phenyl wherein said substituent is C_1–C_6 alkyl, C_1–C_6 alkoxy, cyano, halo, nitro, amino, carboxy, hydroxy, —SH, sulfamoyl, C_1–C_6 alkylthio and phenyl.

4,567,277

SALTS OF 2-(METHOXY-CARBONYLAMINO)-BENZIMIDAZOLE

Hans-Norbert Marx, Buehl-Weitenung, and Ernst-Heinrich Pommer, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 421,417, Sep. 22, 1982, abandoned. This application May 16, 1985, Ser. No. 734,823

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138575

Int. Cl.⁴ C07D *235/32*

U.S. Cl. 548—306 **2 Claims**

1. A salt of 2-(methoxy-carbonylamino)-benzimidazole with 4-phenolsulfonic acid or with sulfamic acid.

4,567,278

PROCESS FOR RACEMIZING CERTAIN SPIRO COMPOUNDS

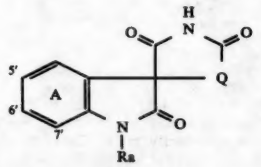
Geoffrey R. Bedford, Congleton; David R. Brittain, Rochdale, and Ronald Platt, MacClesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, United Kingdom

Filed Mar. 26, 1984, Ser. No. 593,312

Int. Cl.⁴ C07D *487/10*

U.S. Cl. 548—309 **9 Claims**

1. A process for the manufacture of a compound of the formula I



in racemic form, wherein Ra is (2–12C)alkyl, or naphthylmethyl or cinnamyl optionally bearing one or two halogeno substituents, or benzyl optionally bearing one or two substituents independently selected from halogen, (1–4C)alkyl, (1–4C-)alkoxy, cyano, nitro and trifluoromethyl located in the 2-, 3-, 4- or 5-position of the phenyl moiety; benzene ring A optionally bears one or two substituents independently selected from halogeno, (1–4C)alkyl, trifluoromethyl and nitro; and Q is methylene or imino; but Ra is other than ethyl, n-propyl or

unsubstituted benzyl when benzene ring A is unsubstituted and Q is imino; characterised by heating an enantiomeric form of the compound of formula I; or a mixture of both enantiomeric forms of said compound containing an excess of one enantiomeric form over the other; at a temperature in the range 80° to 280° C.

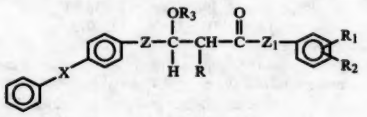
4,567,279

DIARYLHYDROXY ALKANONES AND ALKENONES ANTIALLERGY AGENTS

Wan-kit Chan, Yorktown Heights, N.Y., assignor to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Dec. 13, 1984, Ser. No. 681,409
Int. Cl.[4] C07D *209/04;* C07C *69/76, 67/02*
U.S. Cl. 548—491 18 Claims

1. A compound of the formula:



wherein,

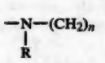
Z and Z_1 each are alkylene chains containing up to three carbon atoms in the principal chain and a total of up to five carbon atoms and include from 0–1 double bonds;

R is H or lower alkyl;

R_1 and R_2 each are H, lower alkyl, OH, lower alkoxy, benzyloxy, carboxy, alkylenecarboxy or alkylcarbonyl;

R_3 is H, lower alkyl, aryl or lower alkanoyl; and

X is $—O(CH_2)_n—$, —CH=CH—, $—(CH_2)_{n'}—$, $—S(CH_2)_n—$ or



wherein n=O and n'=1 or 2 .

4,567,280

PROCESS FOR PRODUCING IODO-AROMATIC COMPOUNDS

Hiroshi Itatani; Mikito Kashima, both of Chiba, and Yasutaka Tasaki, Narashino, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Sep. 4, 1984, Ser. No. 646,749
Claims priority, application Japan, Sep. 6, 1983, 58-162637
Int. Cl.[4] C07C *17/12*
U.S. Cl. 549—43 10 Claims

1. In a process for producing an iodo-aromatic compound which comprises iodinating an aromatic compound having an electron-donating substituent bonded to the benzene ring with iodine in the presence of a solvent, the improvement wherein the reaction is carried out in the presence of nitrogen dioxide which is added to the reaction system in the form of NO_2 in an amount of about ½ to about 10 moles NO_2, per mole of iodine added to the reaction system.

4,567,281

PREPARATION OF LACTONE-FUSED AROMATIC COMPOUNDS

Robert A. Dubois, Franklin, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1983, Ser. No. 501,741
Int. Cl.[4] C07D *307/83, 311/20*
U.S. Cl. 549—288 21 Claims

1. A process for cyclizing an ortho-alkenyl arenol, wherein the double bond of the alkenyl moiety is one or two carbons removed from the aromatic ring, with carbon monoxide, wherein the process comprises contacting an ortho-alkenyl arenol with carbon monoxide in the presence of a catalytic amount of a catalyst comprising (1) a rhodium-carbonyl complex and (2) an amine with pK_a of 6 or greater, arsine, phosphine, stibine or mixture thereof, under conditions such that a lactone-fused aromatic compound is prepared.

4,567,282

METHOD OF PRODUCING (S)-GLYCERALDEHYDE ACETONIDE

Yukio Mizuno, Ibaraki, and Keiichi Sugimoto, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 26, 1984, Ser. No. 665,435
Claims priority, application Japan, Oct. 28, 1983, 58-203145
Int. Cl.[4] C07D *317/00*
U.S. Cl. 549—450 6 Claims

1. A method of producing (S)-glyceraldehyde acetonide, which comprises reacting 3,4-O-isopropylidene-L-threonic acid or a salt thereof with hypochlorite ion or hypochlorous acid under an acid condition.

2. A method of producing (S)-glyceraldehyde acetonide, which comprises reacting 5,6-O-isopropylidene-L-ascorbic acid or a salt thereof with an oxidizing agent to produce 3,4-O-isopropylidene-L-threonic acid or a salt thereof and then reacting the 3,4-O-isopropylidene-L-threonic acid or a salt thereof with hypochlorite ion or hypochlorous acid under an acid condition.

3. A method of producing (S)-glyceraldehyde acetonide, which comprises (1) reacting L-ascorbic acid or a salt thereof with acetone or a conventional equivalent thereof to produce 5,6-O-isopropylidene-L-ascorbic acid or a salt thereof, (2) reacting the 5,6-O-isopropylidene-L-ascorbic acid or a salt thereof with an oxidizing agent to produce 3,4-O-isopropylidene-L-threonic acid or a salt thereof, and (3) reacting the 3,4-O-isopropylidene-L-threonic acid or a salt thereof with hypochlorite ion or hypochlorous acid under an acid condition.

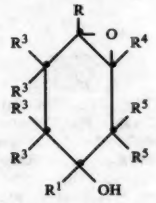
4,567,283

INTERMEDIATES FOR OXABICYCLOALKANE HERBICIDES

George B. Payne; Samuel B. Soloway, both of Modesto; James E. Powell, Ripon, all of Calif.; Steven A. Roman, Fulshear, Tex., and Willy D. Kollmeyer, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 416,572, Sep. 13, 1982, which is a continuation-in-part of Ser. No. 331,094, Dec. 16, 1981, abandoned. This application Jun. 25, 1984, Ser. No. 624,551
Int. Cl.[4] C07D *303/14, 303/46, 303/40, 303/34, 303/22*
U.S. Cl. 549—546 5 Claims

1. A compound of the formula If



If

wherein

R is a methyl;

R^1 is an alkyl group containing from 1 to 10 carbon atoms substituted by up to 3 halogen atoms, each having an atomic number of from 9 to 35, inclusive, or by a hydroxy group, a cyano group, an alkoxy group containing from 1 to 4 carbon atoms, a C_{1-6} alkylsulfonyl group, a C_{6-10}

arylsulfonyl group, a C_{7-11} aralkylsulfonyl group, a C_{1-6} alkoxycarbonyl group, or is a phenyl or benzyl group;
each R^3 is a hydrogen atom;
R^4 is a hydrogen atom;
each R^5 is a hydrogen atom;
and having the cis-stereoisomeric form.

4,567,284

COBALT COMPLEX OF N-ALKYLALKANOHYDROXAMIC ACID

Bruce F. Monzyk, Maryland Heights, and Arthur R. Henn, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 566,015, Dec. 27, 1983. This application Dec. 17, 1984, Ser. No. 682,117
Int. Cl.[4] C07F *15/06*
U.S. Cl. 556—37 **9 Claims**

1. A cobalt complex of N-alkylalkanohydroxamic acid having 8–30 carbon atoms and a solubility in hydrocarbon solvents of at least 2% by weight and organic solutions of said complex.

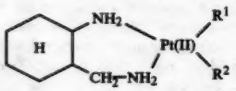
4,567,285

COMPLEX COMPOUNDS OF PLATINUM

Yoshinori Kidani, and Masahide Noji, both of Nagoya, Japan, assignors to Yoshinori Kidani, Nagoya, Japan

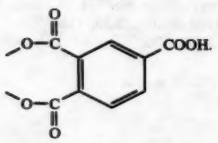
Filed Jul. 10, 1985, Ser. No. 753,537
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—137 **7 Claims**

1. Complex compounds represented by the formula(I):



(I)

wherein one of R^1 and R^2 represents a group selected from the group consisting of (1) glucuronato groups whose hydroxyl groups may be acylated, (2) gluconato groups whose hydroxyl groups may be acylated, (3) pyruvato group and (4) nitrato group, and the other of R^1 and R^2 represents a group selected from the group consisting of (i) glucuronato groups whose hydroxyl groups may be acylated, (ii) gluconato groups whose hydroxyl groups may be acylated, (iii) pyruvato group and (iv) halogen atoms, or R^1 and R^2 represent together the group represented by the formula (II):



(II)

4,567,286

PREPARATION OF HYDROGENATED SILANES BY REDISTRIBUTION OF HYDROSILANES

Jean-Luc Lepage, Sainte-Foy-Les-Lyon, and Gerard Soula, Meyzieu, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Sep. 28, 1984, Ser. No. 655,722
Claims priority, application France, Sep. 28, 1983, 83 15403
Int. Cl.[4] C07F *7/08, 7/12*
U.S. Cl. 556—469 **20 Claims**

1. A process for the preparation of a hydrogenosilane, comprising redistributing (1) a silane having the formula H_mSiX_{4-m} in which X is halogen or an alkoxy group and m is an integer equal to 0, 1, 2 or 3, by reacting said silane with (2) an alkyl or aryl hydrogenosilane having the formula $R_nH_pSiX'_{4-(n+p)}$ in which X' is halogen or an alkoxy group, R is at least one alkyl or aryl group, which may be identical or different, and n and p, which may be identical or different, are integers equal to 1, 2 or 3, with the proviso that $n+p \leqq 4$, in the presence of (3) a catalytically effective amount of a catalyst system which comprises (i) at least one ionic inorganic salt having the formula M^+A^- and (ii) a compound which complexes the M^+ cation of said salt (i) and at least partially solubilizes and dissociates same in the medium of reaction.

4,567,287

PREPARATION OF CARBAMATES FROM ORGANIC CARBONATES AND AROMATIC UREAS

Floro F. Frulla, Wallingford; Fred A. Stuber, North Haven, and Peter J. Whitman, Hamden, all of Conn., assignors to The Upjohn Co., Midland, Mich.

Filed Aug. 8, 1984, Ser. No. 638,800
Int. Cl.[4] C07C *125/065, 125/073*
U.S. Cl. 560—024 **18 Claims**

1. In a process for the preparation of a carbamate by heating at a temperature of from about 75° C. to about 200° C. at least a molar equivalency of an organic carbonate selected from the group consisting of dialkyl, diaryl, diaralkyl, and cyclic esters of carbonic acid with each equivalent of a urea selected from the group consisting of an aromatic urea, an aromatic polyurea, and mixtures thereof in the presence of a catalyst, the improvement which comprises employing aluminum metal as catalyst with a promoter combination of a mercury salt and iodine.

4,567,288

1-ARYL 2-AMINOMETHYL CYCLOPROPANE CARBOXYLATES (Z)

Henri Cousse; Gilbert Mouzin; Bernard Bonnaud; Marie Charveron, all of Castres, and Francois Fauran, Castanet-Tolosan, all of France, assignors to Pierre Fabre S.A., Castres, France

Continuation of Ser. No. 390,811, Jun. 22, 1982, Pat. No. 4,507,318. This application Oct. 1, 1984, Ser. No. 656,443
Claims priority, application France, Jun. 23, 1981, 81 12311
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] C07C *79/46, 101/30, 101/02*
U.S. Cl. 560—37 **8 Claims**

1. A 1-phenyl-1-lower-alkoxy carbonyl 2-aminomethyl cyclopropane (Z), wherein the 1-phenyl radical is substituted by hydroxy, methoxy, halo, amino, or nitro, and wherein aminomethyl is primary aminomethyl, monoloweralkylaminomethyl, or diloweralkylaminomethyl, or a pharmaceutically-acceptable acid addition salt thereof.

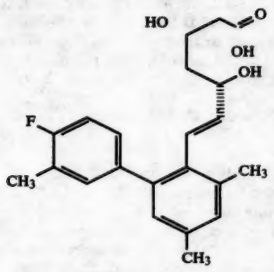
4,567,289

SUBSTITUTED PYRANONE INHIBITORS OF CHOLESTEROL SYNTHESIS

Alvin K. Willard, Wilmington, Del.; Frederick C. Novello, Berwyn; William F. Hoffman, and Edward J. Cragoe, Jr., both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 387,065, Jun. 10, 1982, Pat. No. 4,459,423, Division of Ser. No. 233,521, Feb. 11, 1981, Pat. No. 4,375,475, which is a continuation-in-part of Ser. No. 140,323, Apr. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 67,574, Aug. 1, 1979, abandoned. This application Apr. 25, 1984, Ser. No. 603,806
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—059 **3 Claims**

1. The methyl, ethyl, n-propyl, 2-(acetylamino)ethyl, or 1-(2,3-dihydroxy)propyl ester of E-(3R,5S)-7-(4'-fluoro-3,3',5-trimethyl[1,1'-biphenyl]-2-yl)-3,5-dihydroxy-6-heptenoic acid of structural formula:

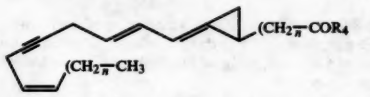


4,567,290
LEUKOTRIENE ANALOGUES

Kyriacos C. Nicolaou, Haverton; Nicos A. Petasis, and Steven P. Seitz, both of Philadelphia, all of Pa., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 325,553, Nov. 27, 1981, Pat. No. 4,442,099. This application Sep. 1, 1983, Ser. No. 528,733
Int. Cl.⁴ C07C *69/743*
U.S. Cl. 560—124 1 Claim

1. A compound of the formula



wherein n is 3;
m is 4; and
R_4 is methoxy.

4,567,291
2-METHYL-2-BUTEN-1-YL TIGLATE

Dietmar Lamparsky, Wangen, Switzerland, and Roman Kaiser, Clifton, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 52,175, Jun. 26, 1979, Pat. No. 4,500,729. This application Dec. 12, 1983, Ser. No. 560,353
Claims priority, application Switzerland, Jun. 28, 1978, 7037/78
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.⁴ C07C *69/533*
U.S. Cl. 560—225 1 Claim

1. 2-Methyl-2-buten-1-yl tiglate provided it is not part of a naturally occurring mixture of compounds or part of a synthetic mixture which is the same as said naturally occurring mixture of compounds.

4,567,292
PROCESS FOR PRODUCTION OF ALLYL CARBOXYLATE

Nobuyuki Nagato, Saitama; Kenichiro Maki, Kanagawa; Tomoe Uematsu, Kanagawa, and Ryoji Ishioka, Kanagawa, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,024
Int. Cl.⁴ C07C *67/05*
U.S. Cl. 560—245 4 Claims

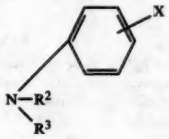
1. A process for producing an allyl carboxylate comprising the step of reacting propylene, oxygen or oxygen-containing gas, and a lower saturated carboxylic acid in the presence of a catalyst at a temperature of 100° C. to 300° C. and a pressure of 0 to 30 atm (gauge) in a vapor phase, said catalyst being prepared by supporting, on a carrier, at least one alkali metal acetate and at least one bivalent palladium salt in the presence of:

(A) at least one organic base selected from the group consisting of

(i) aliphatic amines having the formula:

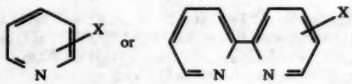
wherein R^1, R^2, and R^3 may be the same or different and represent hydrogen, or an alkyl group having 1 to 10 carbon atoms or benzyl group optionally substituted with —CN, —OR, —COOR, or a $—N(R)_2$ group wherein R is H or an alkyl group having 1 to 3 carbon atoms, or any two groups of R^1, R^2, and R^3 may together form a ring provided that R^1, R^2, and R^3 are not simultaneously hydrogen;

(ii) aromatic amines having the formula:



wherein X represent —R, —CN, —OR, —COOR, $—NO_2$, or $—N(R)_2$ wherein R is the same as defined above, R^2 and R^3 are the same as defined above; and

(iii) nitrogen-containing cyclic compounds having the formula:



wherein X is the same as defined above; and/or

(B) at least one carboxylic acid having the formula:

$$Y—(CH_2)_n\,COOH$$

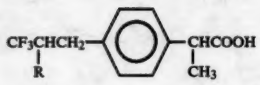
wherein Y represents —OR, —CN, —COOR, $—CH(R)NH_2$, —COR, $—N(CH_2COOH)_2$, —NHCH-$_2$COOH, or $—CH(R^1)X$ group wherein R, R^1, and X are the same as defined in (A) above, and n is an integer of 1 to 4.

4,567,293
2-[PARA-(2-SUBSTITUTED OR UNSUBSTITUTED-3,3,3-TRI-FLUOROPROPYL)-PHENYL]PROPIONIC ACID OR A SALT THEREOF

Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachiohji; Takashi Yamauchi, and Akira Iizuka, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 430,779, Sep. 30, 1982, abandoned. This application Feb. 20, 1985, Ser. No. 702,861
Claims priority, application Japan, Oct. 14, 1981, 56-163872; Jan. 14, 1982, 57-4747; Aug. 6, 1982, 57-136937
Int. Cl.⁴ C07C *57/30, 53/134*
U.S. Cl. 562—496 12 Claims

1. A compound represented by the general formula (I):



(I)

wherein R is a hydrogen atom, a methyl group or a trifluoromethyl group, or a salt thereof.

4,567,294

PREPARATION OF AMMONIUM CARBAMATE

Manfred Dressel, Maxdorf; Heinrich Eberle, Ludwigshafen; Willi Ripperger, Frankenthal; Wolfgang Ruehenbeck, Birkenau, and Werner Zwick, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,063

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346719

Int. Cl.[4] C07C *125/02*

U.S. Cl. 562—555 4 Claims

1. A process for the preparation of ammonium carbamate by reacting ammonia with carbon dioxide, wherein the reactants are introduced into a layer of ammonium carbamate which is kept in the fluidized state by means of gaseous ammonia or carbon dioxide, and the temperature is kept below 25° C. by cooling.

4,567,295

COMPOSITION ACTIVE AGAINST MITES, WHITEFLY AND THRIPS, PHARMACEUTICAL COMPOSITION, AND NEW BENZOYLUREA COMPOUNDS

Marius S. Brouwer, and Arnoldus C. Grosscurt, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

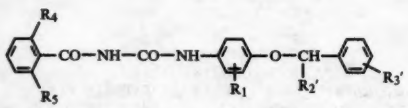
Filed Jan. 19, 1984, Ser. No. 572,144

Claims priority, application Netherlands, Jan. 24, 1983, 8300237

Int. Cl.[4] C07G *127/19*

U.S. Cl. 564—44 3 Claims

1. A composition, active against mites, whitefly and thrips, characterized in that, in addition to a liquid or solid inert carrier material, the composition comprises a benzoylurea compound of the formula



(II)

wherein

R_1 is a hydrogen atom or represents 1 or 2 substituents which are selected from the group consisting of chlorine, methyl and trifluoromethyl;

R'_2 is a C_{3-4} cycloalkyl group;

R'_3 is a hydrogen atom or represents 1 or 2 substituents which are selected from the group consisting of halogen, haloalkyl and haloalkoxy having 1–4 carbon atoms; and

R_4 and R_5 are both fluorine atoms, or wherein

R_4 is a chlorine atom and R_5 is a hydrogen atom.

4,567,296

1-FLUORO-1,1,5-TRINITRO-3-OXA-5-AZAHEXANE AND METHOD OF PREPARATION

Theodore C. Adams, Jr., Beltsville, and Horst G. Adolph, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1984, Ser. No. 626,510

Int. Cl.[4] C07C *111/00, 69/63;* C06B *25/34*

U.S. Cl. 564—111 4 Claims

1. 1-fluoro-1,1,5-trinitro-3-oxa-5-azahexane.

2. A method of preparing 1-fluoro-1,1,5-trinitro-3-oxa-5-azahexane comprising:

(1) reacting one mole of 2-nitro-2-azapropyl trifluoroacetate with one mole of 2-fluoro-2,2-dinitroethanol in a polar solvent at a temperature of from 0° C. to 40° C. to form 1-fluoro-1,1,5-trinitro-3-oxa-5azahexane, wherein the reaction is run under vacuum to remove trifluoroacetic acid generated by the reaction; and

(2) isolating the product 1-fluoro-1,1,5-trinitro-3oxa-5-azahexane.

4,567,297

PREPARATION OF AQUEOUS N-METHYLOL AMIDE SOLUTIONS

Peter Ball, Emmerting; Klaus Marquardt; Manfred Selig, both of Burghausen, and Günther Staudinger, Munich, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,711

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414525

Int. Cl.[4] C07C *102/00*

U.S. Cl. 564—208 8 Claims

1. A process for the preparation of aqueous solutions of N-methylol-acrylamide and/or N-methylol-methacrylamide comprising forming a homogeneous mixture of aqueous solution of formaldehyde and aqueous solution of acrylamide and/or methacrylamide and passing the homogeneous mixture through an ion-exchange resin bed based on a styrene-divinylbenzene polymer with tertiary amino groups at an elevated temperature so that the reaction is at least 80% theoretically completed when the mixture issues from the bed, characterized in that the ion exchanger is initially in the form of its free base, the initial temperature and velocity of homogeneous mixture being adjusted to maintain the bed temperature between 35° and 60° C. and continuing the passage of the homogeneous mixture through the exchanger bed until the bed temperature drops and/or the pH of the exiting solution is below 8.

4,567,298

POLY(DIPROPARGYLAMINE) AND DERIVATIVES THEREOF PER SE AND P-DOPED AND PROCESSES FOR PREPARING SAME

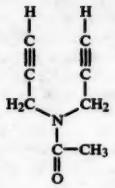
Yoshiyuki Okamoto, Fort Lee, N.J., and Edward F. Hwang, Brooklyn, N.Y., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 579,407, Feb. 13, 1984, Pat. No. 4,497,727. This application Aug. 10, 1984, Ser. No. 639,457

Int. Cl.[4] C07C *103/127*

U.S. Cl. 564—215 1 Claim

1. A compound of the formula:



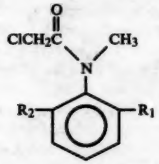
4,567,299

HERBICIDAL 2-HALOACETANILIDES

Gerhard H. Alt, University City, and James S. Bannon, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 24, 1984, Ser. No. 685,872
Int. Cl.[4] C07C *103/34*; A01N *37/18*
U.S. Cl. 564—214 12 Claims

1. Compounds having the formula



wherein R_1 is n-butyl or sec-butyl and R_2 is methyl or ethyl, provided that when R_1 is n-butyl, R_2 is methyl.

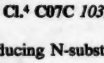
4,567,300

PROCESS FOR PRODUCING N-SUBSTITUTED FORMAMIDES

Yoshikazu Murao, Machida; Shigeru Sawayama, and Kohichi Satoh, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,252
Claims priority, application Japan, Jan. 14, 1984, 59-5232; Mar. 13, 1984, 59-47967
Int. Cl.[4] C07C *103/127*
U.S. Cl. 564—215 19 Claims

1. A process for producing N-substituted formamide represented by the formula:



wherein R represents a hydrogen atom or the residual radical of a primary or secondary alcohol obtained by reacting N-(α-hydroxyethyl)formamide with such alcohol, as hereinafter specified, said process comprising the steps of reacting formamide with acetaldehyde in the presence of a basic catalyst and if required, further reacting the thus obtained N-(α-hydroxyethyl)formamide with a primary or secondary alcohol in the presence of an acid catalyst.

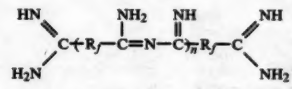
4,567,301

PERFLUORO (IMIDOYLAMIDINE) DIAMIDINES

Robert W. Rosser; Timothy S. Chen, and Chung-Heng Cheng, all of San Jose, Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 528,777, Sep. 2, 1983, abandoned, which is a division of Ser. No. 366,025, Apr. 6, 1982, Pat. No. 4,434,106. This application Jun. 5, 1985, Ser. No. 741,405
Int. Cl.[4] C07C *123/00*
U.S. Cl. 564—243 3 Claims

1. A perfluoro(imidoylamidine)diamidine compound of the formula:



wherein n is a single number selected from 2 to 50 inclusive and wherein each R_f is selected from perfluorocarbons of the formula $-C_pF_{2p}-$ wherein p is a number from 2 to 18 inclusive, and oligomeric perfluoralkylethers of the formula:

$$-CFY(OCF_2CFY)_m-O-(CF_2)_q-O-(CFYCF_2O)_n-CFY-$$

Y is F or CF_3, q is a number from 1 to 18 and m and n are each numbers, the sum of which is from 2 to 7.

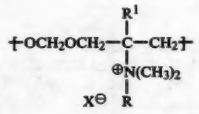
4,567,302

POLYMERIC QUATERNARY AMMONIUM SALTS POSSESSING ANTIMICROBIAL ACTIVITY AND METHODS FOR PREPARATION AND USE THEREOF

Kallidaikurichi N. Sivaramakrishnan, 4330 S. Sixth St., Terre Haute, Ind. 47802

Filed Jul. 20, 1984, Ser. No. 632,819
Int. Cl.[4] C07C *93/04*
U.S. Cl. 564—286 23 Claims

1. The polymeric quaternary ammonium salt have the formula I:



(I)

wherein R is C_{1-20} alkyl, C_{5-7} cycloalkyl or aralkyl group, R^1 is methyl or ethyl and X is a halogen atom.

9. The method of preparing polymeric quaternary ammonium salts comprising the steps of:

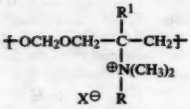
(a) initially reacting 2-nitro-2-methyl-1,3-propanediol or 2-nitro-2-ethyl-1,3-propanediol or a mixture thereof and trioxane in a solvent containing an acid to obtain a first product;

(b) reducing said first product by dissolving said first product in a solvent and maintaining the resulting solution under a hydrogen atmosphere in the presence of a reduction catalyst to obtain a second product;

(c) alkylating said second product by maintaining said second product under a hydrogen atmosphere in the presence of a formaldehyde solution, a solvent and an alkylation catalyst to obtain a third product; and

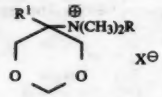
(d) quaternizing said third product by reacting said third product with a halogenated hydrocarbon in the presence of a solvent to obtain quaternary ammonium salts.

23. The method of preparing quaternary ammonium salts as claimed as claim 9, wherein the quaternary ammonium salts comprise a mixture of a compound having the formula I:



(I)

and a compound of formula II:



(II)

wherein R is C_{1-20} alkyl, C_{5-7} cycloalkyl or aralkyl group, R^1 is methyl or ethyl, and X is a halogen.

4,567,303

PROCESS AND APPARATUS FOR PREPARING OR REACTING ALKANOLAMINES

Guenter Boettger, Bad Durkheim; Hans Hammer, Mannheim; Otto Hertel, Ludwigshafen; Gerhard Jeschek, Gruenstadt; Herbert Mueller, Frankenthal; Emil Scharf, Ludwigshafen, and Willibald Schoenleben, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 381,721, May 24, 1982, which is a division of Ser. No. 242,258, Mar. 10, 1981. This application Aug. 6, 1984, Ser. No. 638,522

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010105

Int. Cl.[4] C07C *65/01*

U.S. Cl. 564—475 7 Claims

1. A process for preparing colorless alkanolamines and/or alkylenediamines which comprises thermally reacting ammonia or a reactive amine and an alkylene oxide or alkanolamine in a reactor in which the corrosion-sensitive parts of the reactor are made of substantially nickel-free stainless steel.

4,567,304

PROCESS FOR PREPARING ACETONE AND PHENOL

John W. Fulmer, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 482,298, Apr. 5, 1983, Pat. No. 4,480,134. This application May 24, 1984, Ser. No. 614,124

The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.

Int. Cl.[4] C07C *45/53*

U.S. Cl. 568—385 8 Claims

1. A process for oxidatively preparing phenol and acetone from cumene including the steps of

a. cleaving cumene hydroperoxide to produce a mixture comprising phenol, acetone and side products including heavy residue;

b. separating acetone from phenol and heavy residue;

c. separating the heavy residue from the phenol;

d. treating the said heavy residue at elevated temperature;

e. separating lighter boiling material from heavier boiling material of the residue, said lighter boiling material comprising cumene, α-methylstyrene, and phenol;

f. separating the said lighter boiling material into two fractions, the lighter fraction comprising the bulk of benzene, toluene and ethylbenzene, the heavier fraction comprising the bulk of the phenol, cumene and α-methylstyrene; and

g. not recycling into the process streams any significant portion of the said lighter fraction.

4,567,305

PROCESS FOR CONTINUOUS HYDROFORMYLATION OF ALLYL ALCOHOL

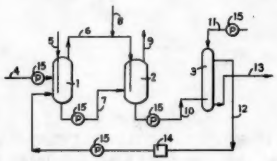
Mitsuo Matsumoto, Kurashiki; Shinichi Miura, Nakajyo; Koichi Kikuchi, Toyonaka; Masuhiko Tamura, Kurashiki; Hidetaka Kojima; Kunio Koga, both of Himeji, and Shigeru Yamashita, Arai, all of Japan, assignors to Kuraray Company, Ltd. and Daicel Chemical Industries, Ltd., both of Okayama, Japan

Filed Jun. 15, 1984, Ser. No. 621,016

Claims priority, application Japan, Jun. 24, 1983, 58-114549

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 6 Claims



1. In the process of continuous hydroformylation of allyl alcohol which includes the steps of, in a reactor, hydroformylating allkyl alcohol with a gaseous mixture of hydrogen and carbon monoxide, in an aromatic hydrocarbon selected from the group consisting of benzene, toluene and xylene, in the presence of a rhodium complex selected from the group consisting of a rhodium complex of the formula $H Rh(Co)(PR_3)_3$, wherein R is an aryl group, and a rhodium carbonyl cluster complex, and in the presence of a trisubstituted phosphine in an amount in excess of the amount of said rhodium complex, then separating hydroxybutyraldehydes from the resulting hydroformylation reaction mixture by extraction with an aqueous medium and recycling the extraction residue to the hydroformylation step as a catalyst-containing solution, the improvement which comprises: the hydroformylation reaction is continuously carried out under conditions such that the value of A defined by formula (I) given below is maintained within the range of 0.2 to 2.5 in substantially the entire reaction zone in which the hydroformylation reaction proceeds:

$$A=(5.67-3.129\times10^{-3}T+3.08\times10^{-5}T^2)\cdot P_{co}-\alpha(\mu/T)^{0.5}(r_{co}/K_Y) \quad (I)$$

where T is the reaction temperature, in °K. and is within the range of 323° K. to 353° K., P_{co} is the logarithmic mean (in atmospheres absolute) between the partial pressure of carbon monoxide in the feed gas entering the reactor in which the hydroformylation reaction is conducted and the partial pressure of carbon monoxide in the effluent gas leaving said reactor and is within the range of 0.01 to 1.0 absolute atmosphere, α is 3,500 for cases where mechanical stirring is performed within the reactor and 1,200 for all other cases, is the viscosity (cp) of the reaction mixture at the reaction temperature and is within the range of 0.1 to 4.0 cp, r_{co} is the rate (moles/liter·hour) of consumption of carbon monoxide in the hydroformylation reaction and is within the range of 0.001 to 10 moles/liter·hour, and K_Y is the rate (millimoles/liter·hour) of absorption of oxygen in water as determined separately from and independently of the hydroformylation reaction by measuring the rate of oxidation of an aqueous sodium sulfite solution with air at 25° C. under atmospheric pressure in the reactor to be used for the hydroformylation reaction and K_Y is within the range of 5 to 500 millimoles/liter·hour, provided that in cases where the reactor in which the hydroformylation reaction is carried out comprises a plurality of reaction chambers, each reaction chamber is regarded as a single reactor and the above constant and variables are selected accordingly.

4,567,306

CONTINUOUS PROCESS FOR THE PRODUCTION OF ALDEHYDES BY HYDROFORMYLATION OF OLEFINS

Alan J. Dennis, Middlesbrough; George E. Harrison, Billericay, and James P. Wyber, Stockton-on-Tees, all of England, assignors to Davy Mckee (London) Limited, London, England

Filed Dec. 12, 1984, Ser. No. 680,834

Claims priority, application United Kingdom, Dec. 23, 1983, 8334359

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—455 17 Claims

1. A continuous hydroformylation process for the production of an aldehyde selected from the group consisting of linear aldehydes and non-liner aldehydes by hydroformylation of an olefin selected from the group consisting of alpha-olefins, substituted alpha-olefins, internal olefins and substituted internal olefins, which comprises:

providing a hydroformylation zone containing a charge of a liquid reaction medium having dissolved therein (a) a complex rhodium hydroformylation catalyst comprising rhodium in complex combination with carbon monoxide and with a cyclic phosphite having a phosphorus atom linked to three oxygen atoms at least two of which form together with the phosphorus atom part of a ring and (b) a ligand stabilising amount of tertiary amine;

supplying said olefin to the hydroformylation zone;

maintaining in the hydroformylation zone a temperature in the range of from about 40° C. to about 160° C. and a pressure in the range of from about 4 bar to about 75 bar; supplying make-up hydrogen and carbon monoxide to the hydroformylation zone; and

recovering from the liquid hydroformylation medium a hydroformylation product comprising at least one aldehyde selected from the group consisting of linear aldehydes and non-linear aldehydes.

4,567,307

TWO-STEP METHANE CONVERSION PROCESS

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, Malvern, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 522,925, Aug. 12, 1983, Pat. No. 4,443,649, and a continuation-in-part of Ser. No. 522,944, Aug. 12, 1983, Pat. No. 4,444,984, and a continuation-in-part of Ser. No. 522,942, Aug. 12, 1983, Pat. No. 4,443,648, and a continuation-in-part of Ser. No. 522,905, Aug. 12, 1983, Pat. No. 4,443,645, and a continuation-in-part of Ser. No. 522,877, Aug. 12, 1983, Pat. No. 4,443,647, and a continuation-in-part of Ser. No. 522,876, Aug. 12, 1983, Pat. No. 4,443,644, and a continuation-in-part of Ser. No. 522,906, Aug. 12, 1983, Pat. No. 4,443,646, and a continuation-in-part of Ser. No. 522,935, Aug. 12, 1983, and a continuation-in-part of Ser. No. 522,938, Aug. 12, 1983, said Ser. No. 522,925, is a continuation-in-part of Ser. No. 412,667, Aug. 30, 1982, abandoned, said Ser. No. 522,944, is a continuation-in-part of Ser. No. 412,655, Aug. 30, 1982, abandoned, said Ser. No. 522,942, is a continuation-in-part of Ser. No. 412,662, Aug. 30, 1982, abandoned, said Ser. No. 522,905, is a continuation-in-part of Ser. No. 412,663, Aug. 30, 1982, abandoned, said Ser. No. 522,877, is a continuation-in-part of Ser. No. 412,664, Aug. 30, 1982, abandoned, said Ser. No. 522,876, is a continuation-in-part of Ser. No. 412,665, Aug. 30, 1982, abandoned, said Ser. No. 522,906, is a continuation-in-part of Ser. No. 412,666, Aug. 30, 1982, abandoned, said Ser. No. 522,935, is a continuation-in-part of Ser. No. 412,649, Aug. 30, 1982, abandoned, said Ser. No. 522,938, is a continuation-in-part of Ser. No. 412,650, Aug. 30, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,657

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.[4] C07C *2/02, 5/00*

U.S. Cl. 585—330 15 Claims

1. A process for converting methane to higher hydrocarbon products which comprises:

(a) contacting methane with a first agent at conditions effective to produce higher hydrocarbon products and water, said first agent comprising at least one reducible oxide of at least one metal which oxide when contacted with methane at a temperature in the range of about 500° C. to about 1000° C. is reduced and produces higher hydrocarbon products and water; and

(b) oligomerizing at least a portion of said higher hydrocarbon product to still higher hydrocarbon products in the presence of an effective amount of a second agent capable of promoting said oligomerization, provided that the composition of said first agent is different from the composition of said second agent.

4,567,308

PROCESS FOR PREPARING ALKYLCYCLOPENTADIENE DERIVATIVES

Zenichi Yoshida, 281, Ginza-cho 4-chome, Fushimi-ku, Kyoto-shi, Kyoto-fu; Susumu Kato; Yasuhiro Amemiya, both of Osaka, and Keisuke Yanai, Nara, all of Japan, assignors to Asahi Chemical Co., Ltd. and Zenichi Yoshida, both of, Japan

Filed Mar. 21, 1985, Ser. No. 714,261

Claims priority, application Japan, Mar. 26, 1984, 59-59070; Nov. 9, 1984, 59-237272; Feb. 18, 1985, 60-29927

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—375 8 Claims

1. A method of alkylation of a cyclopentadiene derivative comprising the vapor-phase reaction of a cyclopentadiene derivative and an aliphatic lower alcohol in the presence of the following heterogeneous basic catalyst (A) or (B):

(A) at least one member selected from the group consisting of oxides, hydroxides and salts of alkaline earth metals or alkali metals, provided that the oxide or hydroxide of an alkali metal is not solely used and that a combination of these two compounds is not used,

(B) a mixture of the following (a) and (b):

(a) at least one member selected from the group consisting of oxides, hydroxides and salts of alkaline earth metals or alkali metals,

(b) at least one member selected from the group consisting of elements of groups (I) to (VIII), 2 to 7 periods of the periodic table, and oxides, hydroxides and carbonates of these elements, provided that oxides, hydroxides and carbonates of alkaline earth metals and alkali metals are excluded.

4,567,309

SEPARATION OF 1,3-BUTADIENE

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 29, 1984, Ser. No. 614,935

Int. Cl.[4] C07C *7/12*

U.S. Cl. 585—829 5 Claims

1. A process for separating 1,3-butadiene from a feed mixture comprising 1,3-butadiene butadiene and at least one other C_4 hydroarbon, which process comprises contacting said feed mixture, in liquid phase at adsorption conditions, with an adsorbent comprising activated or molecular sieve carbon which selectively adsorbs said 1,3-butadiene, removing the unabsorbed portion of said feed mixture form said adsorbent, and recovering said 1,3-butadiene by desorption thereof from the adsorbent with a liquid desorbent material comprising a C_3 or C_5 through C_{10} n-olifin, said feed mixture and said desorbent material having boiling points of at least 5° C. difference.

4,567,310

PREPARATION OF MODIFIED ZEOLITES AND THEIR UTILIZATION

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 526,764, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 355,419, Mar. 8, 1982, abandoned. This application Feb. 13, 1985, Ser. No. 701,313

Int. Cl.[4] C07C *1/20*

U.S. Cl. 585—408 25 Claims

12. In the process for the conversion of feed compositions of alkyl alcohols having up to four carbon atoms and ethers derived therefrom wherein said feed is contacted at elevated temperatures and pressures with a crystalline ZSM-5 type zeolite having a Constraint Index of about 1 to about 12 and a silica-to-alumina ratio no greater than 300, the improvement which comprises treating said ZSM-5 type zeolite with boron trifluoride in order to enhance its activity prior to said conversion of said feed.

4,567,311

CONVERSIONS OF LOW MOLECULAR WEIGHT HYDROCARBONS TO HIGHER MOLECULAR WEIGHT HYDROCARBONS USING A SILICON COMPOUND-CONTAINING CATALYST

Louis DeVires, Greenbrae, and P. R. Ryason, Santa Rosa, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1983, Ser. No. 547,697

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—415 9 Claims

1. A process for the production of higher molecular weight hydrocarbons from lower molecular hydrocarbons comprising the steps of:

(a) introducing into a reaction zone a lower molecular weight hydrocarbon-containing gas and contacting said gas in said zone with a silicon carbide-containing catalyst under C_2+ hydrocarbon synthesis conditions such that at least 15 mole percent of the lower molecular weight hydrocarbons in said gas are converted to higher molecular weight hydrocarbons, said conditions including a temperature of greater than 1000° C. and a gas hourly space velocity of greater than 3200 hr^{-1};

(b) withdrawing from said reaction zone a higher molecular weight hydrocarbon-containing stream.

4,567,312

PROCESS FOR PRODUCING ALKYLBENZENES

Stephen J. Miller, San Francisco, and Sue D. Pandey, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 470,425, Feb. 28, 1983, abandoned. This application Jan. 25, 1984, Ser. No. 573,741

Int. Cl.[4] C07C *2/52*

U.S. Cl. 585—419 11 Claims

1. A process for producing n-alkylbenzenes comprising contacting n-paraffins having a carbon number in excess of 15, with a dehydrocyclization catalyst, comprising a large-pore zeolite containing at least one Group VIII metal, under conditions which favor dehydrocyclization to produce said n-alkylbenzenes.

4,567,313

METHOD FOR ISOMERIZING ALKYLBENZENES

Ulf Blindheim, Skedsmokorset; Gerd S. Haegh, Rykkin, and Bjorn P. Nilsen, Sola, all of Norway, assignors to Sentralinstitutt for Industriell Forskning, Oslo, Norway

PCT No. PCT/NO83/00036, § 371 Date May 31, 1984, § 102(e) Date May 31, 1984, PCT Pub. No. WO84/01375, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 26, 1983, Ser. No. 616,184

Claims priority, application Norway, Oct. 1, 1982, 823311

Int. Cl.[4] C07C *5/22, 5/23, 5/25*

U.S. Cl. 585—480 9 Claims

1. A method for isomerization of xylenes, which comprises contacting a feed comprising the xylenes, under isomerization conditions, with a heterogenous catalyst comprising an inorganic oxide support containing at least one mixed oxide compound of SiO_2 and Al_2O_3 at a temperature from 150° to 300° C. and under a pressure of at least about atmospheric pressure, wherein the catalyst is produced by reaction of the support with an aluminum alkyl compound of the formula AlR_yX_{3-y} where R is CH_3, C_2H_5 or C_3H_7, y is 1 or 2, and X is Cl.

4,567,314

PROCESS FOR PRODUCING DIOLEFINS

Paul R. Robinson, Costa Mesa, and Eric L. Moorehead, Diamond Bar, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 335,531, Dec. 29, 1981, Pat. No. 4,455,388, which is a continuation-in-part of Ser. No. 328,446, Dec. 7, 1981, Pat. No. 4,454,245. This application Mar. 30, 1984, Ser. No. 595,333

Int. Cl.[4] C07C *5/327*

U.S. Cl. 585—621 29 Claims

1. A method for producting diolefins from mono-olefins which comprises reacting a feedstream comprising a gas containing helium, molecular oxygen and a C_4 to C_8 mono-olefin under reaction conditions, in contact with an oxidative dehydrogenation catalyst defined by the formula:

$$Me_aV_bP_cSn_dO_eX$$

wherein X is crystalline silica, Me is an alkali metal, a is 0.10 to 2, b is 0.10 to 1, c is 1, d is 0.001 to 0.30 and e is a number which satisfies the valence requirements of the other elements present.

4,567,315

PROCESS FOR PURIFICATION OF LIQUID PARAFFINS

Fathi A. Owaysi, Safat, and Rasheed S. Al-Ameeri, Bayan, both of Kuwait, assignors to Kuwait Institute for Scientific Research, Safat, Kuwait

Filed May 11, 1984, Ser. No. 609,121

Int. Cl.[4] C07C *7/13;* C10G *25/03*

U.S. Cl. 585—827 20 Claims

7. A liquid phase process for purifying a C_8–C_{24} liquid paraffin feedstock, which feedstock contains an undesirably high concentration of aromatic hydrocarbon impurities, comprising the steps of:

adjusting the temperature of the liquid paraffin feedstock to about 60° C.–120° C.;

contacting the liquid paraffin feedstock at a temperature of from about 60° C. to about 120° C. with an X-type zeolite molecular sieve material for selectively adsorbing the aromatic impurities therefrom;

recovering an aromatic hydrocarbon-deleted liquid paraffin product, in the liquid phase, from said X-type zeolite molecular sieve material, said aromatic hydrocarbon-depleted liquid paraffin product containing less than about 0.01% by weight aromatic hydrocarbons;

desorbing the adsorbed aromatic hydrocarbons from said zeolite molecular sieve material by passing a liquid desorbing solvent therethrough at a temperature of from about 60° C. to about 120° C.; and

washing the desorbed aromatic hydrocarbons from said zeolite molecular sieve material with a first liquid phase washing solvent.

4,567,316

SOLAR CELL MODULE

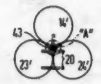
Reinhard Hollaus, Taufkirchen; Rudolf Zehetbauer, and Klaus Bednorz, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

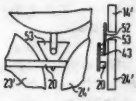
Filed Feb. 27, 1984, Ser. No. 583,875

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307202

Int. Cl.[4] H01L *31/04*

U.S. Cl. 136—246 1 Claim





1. Solar cell module assembly, comprising a plurality of individual solar cells disposed in rows and at least partly electrically interconnected in series, at least one bypass diode shunted across at least some of said series-connected solar cells, said at least one diode being noramlly cut off during operation of said solar cell module and directly integrated into said solar cell module, a conductor ribbon electrically interconnecting two of said solar cells in series, and a sheet metal cooling body connected to said conductor ribbon, said at least one bypass diode being disposed on said cooling body and being connected between another of said solar cells and said conductor ribbon.

4,567,317

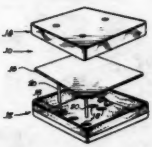
EMI/RFI PROTECTED ENCLOSURE

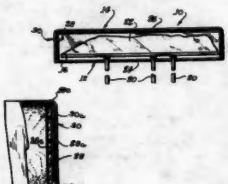
Stephen J. Ehrlich, and Edward I. Nelson, both of Sunrise, Fla., assignors to Computer Products, Inc., Pompano Beach, Fla.

Filed Jul. 7, 1983, Ser. No. 511,452

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 MS 13 Claims





1. A housing for providing EMI/RFI shielding for an electrical apparatus, comprising: complementary first and second shell members each including an end wall portion and an integrally formed circumferential side wall portion; each said side wall portion defining a substantially continuous and unbroken peripheral surface; the side wall portion of the second shell member being configured for an interference fit with said first shell member side wall portion; substantially the entire internally facing surfaces of both of said first and second shell members being electrically conductive for providing effective EMI/RFI shielding; substantial portions of the respective interference-fitted surfaces of said first and second shell members also being electrically conductive in a continuous fashion thereabout; electrically conductive means forming substantially continuous and uninterrupted electrical connections respectively between the interference-fitted surfaces and the internally facing surfaces of each of said shell members for defining continuity of said shielding; and substantially the entire externally facing surfaces of said first and second shell members being electrically non-conductive.

4,567,318

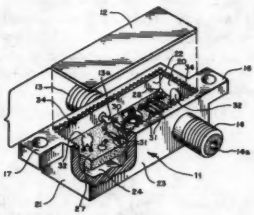
RF SHIELDED ELECTRONIC COMPONENT HOUSING

David F. Shu, Hoffman Estates, Ill., assignor to TDS, Inc., Elk Grove Village, Ill.

Filed Nov. 14, 1983, Ser. No. 551,084

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 GC 19 Claims



1. An electronic component housing comprising:

a base member defining an interior chamber opening to the exterior through an access aperture;

a cover plate member dimensioned to extend over said access aperture;

said base member including around the periphery of said access aperture a ledge portion dimensioned to receive said cover plate;

one of said members being formed of a relatively non-malleable material, the other of said members being formed of a relatively malleable material; and

said one of said members further including a plurality of engaging elements on said ledge portion in interference with said other of said members whereby said other of said members is deformed by said engaging elements to form a plurality of closely spaced mechanical and electrical engagement points providing a mechanical and electrically secure mounting for said cover plate member.

4,567,319

LIGHTWEIGHT CURRENT-CARRYING HOSE

Richard O. Finley, Upland, Calif., assignor to Plastiflex Company International, Fountain Valley, Calif.

Continuation-in-part of Ser. No. 454,035, Dec. 28, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 506,375

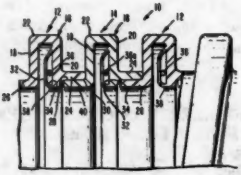
Int. Cl.[4] F16L *11/11, 11/12;* A47L *9/24*

U.S. Cl. 174—47 20 Claims

13. In a combination of a flexible tube with means defining at least one conductor of electromagnetic energy, wherein said tube comprises at least one elongated strip helically wound about an axis into tubular form and said conductor means has a length approximately that of said strip, wherein said strip includes at least two radially-extending components positioned generally normal to the tube axis and generally adjacent to one another, and wherein said strip before and after being helically wound into said tube has centers of mass which are differently

positioned, the improvement in said combination for enabling substantially all tensile and compressive forces exerted on or by said tube from being deleteriously exerted on said conductor means, comprising:

an enclosure on one of said radially-extending components for said conductor means extending along the length of said helically wound strip and having a dimension generally perpendicular to the axis for providing a generally central portion for said conductor mens when said tube is



relatively unbent and a radially-extending path for bidirectional movement of said conductor means that is greater than any movement thereon exerted on or by said tube which would otherwise deleteriously affect said conductor means, said enclosure dimension being at least equal to the distance between the centers of mass to permit movement of said conductor means in said enclosure in response to the tensile and compressive forces exerted on or by said tube.

4,567,320

REINFORCED ELECTRICAL CABLE AND METHOD OF FORMING THE CABLE

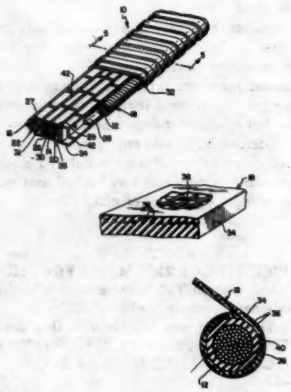
David H. Neuroth, Bethany, and Armand Moscovici, Woodbridge, both of Conn., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Apr. 26, 1983, Ser. No. 488,649

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.⁴ H01B *7/18*

U.S. Cl. 174—103 **20 Claims**



1. A method of constructing a reinforced insulated conductor comprising the steps of

providing a conductor having a core of conducting material and a layer of insulating material surrounding the core, said insulating material being solidified and having an outer radius R at ambient temperatures,

forming a thin tape of unvulcanized thermosetting material imbedded with an open-mesh fabric defining a plurality of spaces therein, the inner side of the tape comprising a layer of the unvulcanized thermosetting material,

applying the tape directly over the exterior of the solidified layer of insulating material to completely cover the exterior thereof, with the thermosetting material contacting the insulating material,

heating the covered conductor for a sufficient period and at a sufficient temperature to allow the outer radius of the solidified insulating material to increase to R1 due to thermal expansion, thereby pushing the unvulcanized thermosetting material radially outwards so that at least part of it flows through the spaces in the open-mesh fabric to the other side thereof and resides there during vulcanization, and maintaining a heated condition until the thermosetting material becomes vulcanized, and

cooling the covered conductor,

the imbedded fabric as applied having a substantially fixed radius R2 that is equal to or greater than the outer radius R1 of the heated insulation.

20. An electrical cable comprising:

a plurality of insulated conductors;

a reinforcing layer applied directly around the exterior of each of said insulated conductors to completely cover said exteriors thereof,

said reinforcing layer comprising a thin tape formed of thermosetting material imbedded with an open-mesh fabric;

a force-resisting support member interposed between adjacent ones of said reinforcing layers, said support member being rigid in cross section for resisting transverse compressive forces;

a sheath enclosing said insulated conductors, reinforcing layers and support member; and

thermosetting material substantially filling the voids between said sheath and said reinforcing layers and support member.

4,567,321

FLEXIBLE FLAT CABLE

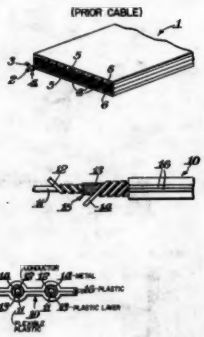
Chiharu Harayama, Atugi, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,762

Claims priority, application Japan, Feb. 20, 1984, 59-23347

Int. Cl.⁴ H01B *7/04, 7/08*

U.S. Cl. 174—117 F **8 Claims**



1. An improved, highly flexible flat multi-conductor electrical cable comprising a plurality of conductor assemblies held in parallel relationship between layers of insulating coverings, the improvement comprising conductor assemblies having an elongate, non-conductive center core filament helically overwrapped along its longitudinal dimension by a first conductor in foil or tape form, this first tape conductor having an outer covering of a conductive, low friction material, said conductor

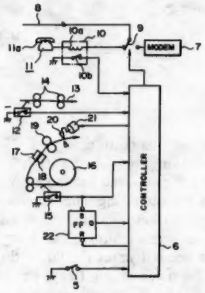
covering being helically overwrapped along its longitudinal dimension by a second conductor in foil or tape form, said second foil conductor being wrapped having a lay different from that of said first conductor.

4,567,322

FACSIMILE APPARATUS

Shin Tsuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1984, Ser. No. 572,849
Claims priority, application Japan, Jan. 27, 1983, 58-10532
Int. Cl.[4] H04M *11/00*; H04N *1/00*
U.S. Cl. 179—2 A **5 Claims**



1. A facsimile apparatus comprising:

a manual switch for instructing start of one of an original image transmission mode, an image reception mode and a recording paper cutting mode;

communication detection means for detecting if said apparatus is available for communication;

original sheet detection means for detecting if an original sheet is present at a predetermined position;

a record paper detection means for detecting if a record paper is present at a predetermined position;

cut control means for controlling cutting of the record paper; and

means for selecting one of the three modes when said manual switch is operated, said selecting means selecting the recording paper cutting mode in the event (1) that said communication detection means detects that said apparatus is not available for communication, (2) said original sheet detection means does not detect an original sheet at its predetermined position, and (3) said record paper detection means detects that a record paper is at its predetermined position.

4,567,323

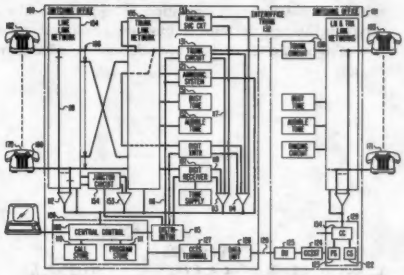
METHOD AND APPARATUS FOR PROVIDING A PLURALITY OF SPECIAL SERVICES

Rosanna M. Lottes, and Grant E. Swinehart, both of Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 12, 1983, Ser. No. 513,079
Int. Cl.[4] H04M *3/42*
U.S. Cl. 179—18 B **52 Claims**

1. For use with a telephone system serving a plurality of stations, a method for providing a plurality of special services; comprising the steps of:

responsive to a call between a particular one and a specific one of said stations, designating a memory dedicated to said particular station for at least a selected one of said special services; and



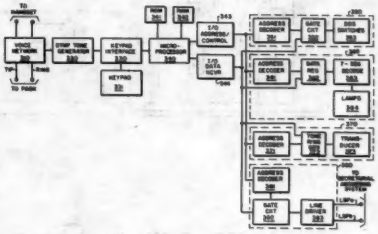
storing in said designated memory information related to said specific station for providing said selected service.

4,567,324

SECRETARIAL TELEPHONE STATION FOR USE WITH A SECRETARIAL ANSWERING SYSTEM

Louis W. Smith, St. Petersburg, Fla., and Janos I. Csapo, Oakton, Va., assignors to GTE Business Communication Systems, Inc., Northlake, Ill.

Filed Oct. 11, 1983, Ser. No. 540,465
Int. Cl.[4] H04M *1/72, 3/50*
U.S. Cl. 179—27 FH **10 Claims**



1. A secretarial telephone answering station for use with a telephone switching system including a switching center, a plurality of subscriber telephone stations all connected to said switching center, each of which is operable as a calling or called subscriber station, and a secretarial answering system connected to said subscriber stations and operative to provide ringing, busy and idle detected messages, each including a ringing, busy or idle code, respectively, and a code identifying a called subscriber station, said secretarial station comprising:

a processing unit connected to said secretarial answering system and and said switching center; and

a plurality of lamp and switch pairs connected to said processing unit, each pair being associated with one of said subscriber stations;

said processing unit being operative in response to said code identifying a called subscriber station and said ringing, busy and idle detected messages to flash, light or darken, respectively, the lamp associated with said identified called subscriber section;

said processing unit being further operative in response to operation of a switch to apply to said switching center a directed call pick up message including a directed call pick up code and a code identifying said associated subscriber station;

said processing unit being further operative in response to subsequent operation of said switch to apply to said

switching center a call transfer message, including a call transfer code and said code identifying said associated subscriber station, and further operative, in response to said subsequent switch operation, to apply to said secretarial answering system, a buzzing requested message including said code identifying said associated subscriber station.

4,567,325

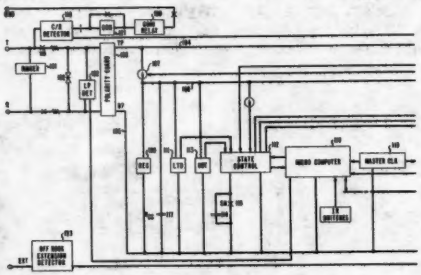
CONTROLLER FOR A COIN TELEPHONE SET

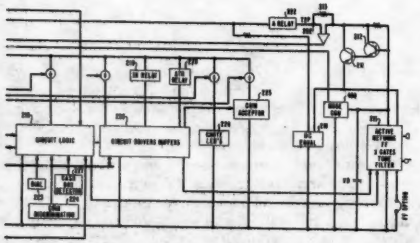
Paul E. Crouch, Freehold, N.J.; Joseph J. Nahas, Wyomissing Hills, Pa., and Howard Ng, Old Bridge, N.J., assignors to AT&T Technologies Inc. and AT&T Bell Laboratories, both of Murray Hill, N.J., a part interest

Filed Dec. 30, 1983, Ser. No. 567,052

Int. Cl.[4] H04M *17/00*

U.S. Cl. 179—6.3 R **13 Claims**





1. A coin telephone station for making calls to a central office over a coin subscriber loop, the station comprising:

sensing means for detecting the level of current flow through the subscriber loop to the telephone station;

coin processing circuitry for recognizing the deposit of coins into the station and transmitting coin deposit information to the central office; and

control means operably responsive to a signal from the sensing means reflecting that the level of current flow has fallen below a predetermined level, the control means inhibiting the coin processing circuitry and causing all deposited coins to be returned to a customer, the coin telephone station retaining a dial and speech capability while the level of current flow is below the predetermined level.

4,567,326

TELEPHONE APPARATUS FOR SELECTIVE OPERATION IN A NORMAL AND REPERTORY DIAL MODE

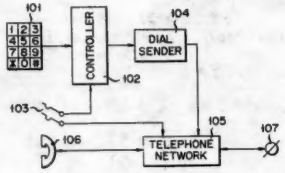
Yasuji Sato; Takao Yamamoto; Yoshikazu Sano, all of Tokyo, Japan, and Yasunobu Nakayama, Tustin, Calif., assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1982, Ser. No. 378,729

Claims priority, application Japan, May 28, 1981, 56-80099

Int. Cl.[4] H04M *1/274*

U.S. Cl. 179—90 B **11 Claims**



1. A telephone apparatus comprising:

keyboard means having at least ten digit keys and at least two special keys for entering data to a telephone network;

controller means for operating said apparatus in (a) a first manual dial setting mode which is responsive to all of said keys and allows transmission of said digit keys to said network, (b) a second manual dial setting mode which allows transmission of said digit keys and said special keys to said network, and (c) an abbreviated dial mode under the control of said two special keys which allows previously stored sequences to be recalled by entering a sequence including said special keys; and

mode switching means including a variable-status hook switch for effecting the switching of said modes in said controller means in response to at least the status of said hook switch.

4,567,327

FLAT-DIAPHRAGM TRANSDUCER AND METHOD OF MANUFACTURING SUCH A TRANSDUCER

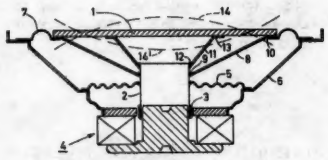
Urbanus P. M. Goossens, and Gustaaf E. M. Fierens, both of Dendermonde, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,274

Claims priority, application Netherlands, Feb. 4, 1982, 8200416

Int. Cl.[4] H04R *7/12*

U.S. Cl. 179—115.5 R **17 Claims**



1. An electrodynamic transducer comprising:

a sound-radiating diaphragm having a substantially flat sound-radiating side, a magnet system having an air gap, a voice coil former with a voice coil mounted thereon and located in said air gap so as to cooperate with the magnet system, a first auxiliary cone for transmitting the movement of the voice coil former to the sound-radiating diaphragm, the first auxiliary cone having an inner rim secured to the voice-coil former and an outer rim secured to

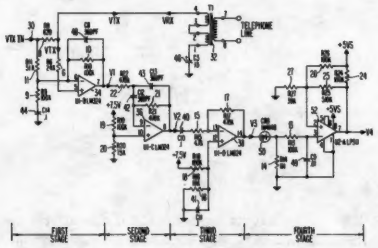
the sound-radiating diaphragm along the periphery of the sound-radiating diaphragm, at least one centering diaphragm connected to the outer rim of the auxiliary cone, and a further auxiliary cone having an inner rim secured to the voice-coil former and an outer rim secured to the sound-radiating diaphragm with the further auxiliary cone disposed inside of the first auxiliary cone.

4,567,328

ENERGY DETECTION CIRCUIT FOR A FACSIMILE SYSTEM CONTROLLER

Francis P. Carrasco, Danbury; Gerard A. DeRome, New Milford, and David W. Fernekes, Danbury, all of Conn., assignors to Burroughs Corp., Detroit, Mich.

Filed May 23, 1984, Ser. No. 613,341
Int. Cl.⁴ H04M *11/00*
U.S. Cl. 179—2 A **18 Claims**



1. In a facsimile system controller, a circuit connected to a transmit-receive path of a transmission line to detect the presence of received energy on the transmission line, said circuit including a signal source coupled to a down line receiver; said circuit comprising:

first means, coupled to said signal source and said transmission line, for nulling out any signals from said signal source which are a component of the transmit-receive path of said transmission line, thereby said first means having a receive signal output solely indicating said received energy; and

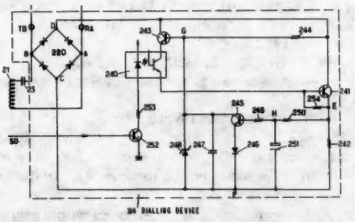
energy detect means, receiving said receive signal, for producing a digital signal indicating the presence and absence of energy in said receive signal.

4,567,329

LINE CIRCUIT FOR NETWORK JUNCTOR

Francois P. Bailly, Palaiseau; Alain Bourgoin, Dourdan, and Renato Israel, Versailles, all of France, assignors to Societe Anonyme de Telecommunications, France

Filed May 14, 1984, Ser. No. 609,976
Claims priority, application France, May 18, 1983, 83 08186
Int. Cl.⁴ H04M *3/00*
U.S. Cl. 179—18 FA **4 Claims**



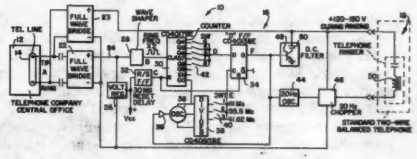
1. A line circuit for network junctor, comprising loop current interrupting means allowing dialling including regulating means for maintaining said loop current about a predetermined threshold and for presenting a high impedance for the telephone frequencies and a low impedance for the ringing currents, said regulating means comprising two transistors forming a Darlington assembly, the first transistor receiving on its base a loop opening or closure control pulse and being in series with a first resistor, the base of the second transistor and the collector of the first transistor being connected by a second resistor, and means for stabilizing the base voltage of said second transistor in order to raise the impedance of said regulating means in the telephone band, means for controlling said regulating means disposed in parallel on said first resistor and comprising a third transistor whose base is connected to the emitter of said first transistor and whose collector is connected to the base of said second transistor, the emitter of said third transistor being connected to said first resistor via a diode in order to improve the regulation for the low voltages.

4,567,330

INTERFACE FOR CONNECTING STANDARD TELEPHONES TO PARTY LINES

Leonard E. Curtin, Houston, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 14, 1984, Ser. No. 620,735
Int. Cl.⁴ H04M *1/00*; H04Q *5/00*
U.S. Cl. 179—17 E **13 Claims**



1. A party line interface for connection at a party line subscriber's location between a party line connected to a central telephone office which provides a party line ringing signal of a different frequency to selectively ring each individual party line subscriber's telephone connected to the party line and a standard telephone which rings in response to the application of a single standard ringing frequency signal comprising:

(a) means for generating a ring command signal in response to the detection of a party line ringing signal of a single frequency, and being programmable to change the single frequency which must be detected to generate the ring command signal; and

(b) means for producing the single standard ringing frequency signal in response to the ring command signal.

4,567,331

ELECTRONIC HYBRID HAVING SYNTHESIZED IMPEDANCE CIRCUITRY

Philip T. Martin, Columbus, Ohio, assignor to ITT Corporation, New York, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,637
Int. Cl.⁴ H04M *19/00*
U.S. Cl. 179—170 NC **11 Claims**

1. A circuit for coupling a two-wire transmission path to a four-wire transmission path, said circuit comprising:

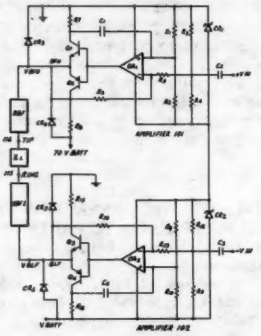
a first amplifier having inputs coupled to said two-wire transmission path and an output coupled to one side of said four-wire transmission path;

first and second circuitry means for each providing combined battery and voice signal injection to said two-wire path whereby a.c. voice signals are combined with d.c. battery potential, each having an input terminal coupled to the other side of said four-wire transmission path and each having an output terminal;

a first battery feed impedance coupled between said first circuit output terminal and one side of said two-wire path;

a second battery feed impedance coupled between said second circuit output terminal and the other side of said two-wire path;

each of said first and second circuits comprising a differential input amplifier having first and second inputs and an output, a first resistor coupled between said input terminal and said first input, a first feedback impedance coupled between said output terminal and said first input:



circuit means coupling said output to said output terminal, a second resistor having one end coupled to a voltage source terminal and its other end coupled to said output terminal via said circuit means, a second feedback impedance coupled between said second resistor other end and said second input, whereby said first and second circuit means each operate to provide an output impedance at the respective said output terminal which is approximately zero for d.c. and is a predetermined non-zero value at voice frequencies.

4,567,332

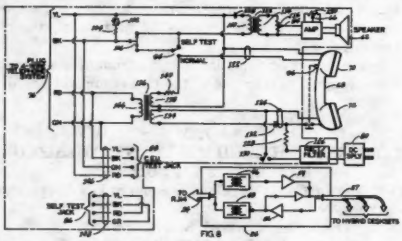
FOUR-WIRE TELEPHONE SYSTEM WITH SELF-TEST MEANS

William E. Jamison, 1459 Reale, St. Louis, Mo. 63138

Filed May 3, 1984, Ser. No. 606,897

Int. Cl.[4] H04M *1/24*

U.S. Cl. 179—175 **13 Claims**



1. For use with a four-wire full duplex telephone system having at least two different location interconnected by an existing four-wire telephone circuit, a four-wire full duplex testset for at least one location for connection to said circuit to provide normal full duplex communication and also to provide testing of integrity of communications at such location, the improvement comprising a line cord including a line core plug for connection of said testset with said existing telephone circuit, self-test circuitry permitting the user of the testset to cause a test mode of operation providing user assurance of proper operation of said testset when testing the integrity of communications with said existing telephone circuit whereby existence of fault within said existing circuit may be readily ascertained with user certainty that fault does not exist within said tester and line cord.

4,567,333

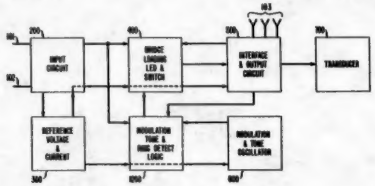
ELECTRONIC TONE RINGER WITH DISTINCTIVE SIGNALING CIRCUITRY

David M. Embree; David C. Goldthorp, both of Reading, Pa.; Howard H. Longenecker, and David R. Vogelpohl, both of Indianapolis, Ind., assignors to AT&T Technologies and AT&T Bell Laboratories, both of Murray Hill, N.J.

Division of Ser. No. 470,150, Feb. 28, 1983, Pat. No. 4,491,691. This application Aug. 23, 1984, Ser. No. 643,343

Int. Cl.[4] H04M *1/00*

U.S. Cl. 179—84 T **8 Claims**



1. A tone ringer having input lines and operatively responsive to the reception of ringing signals applied across said input lines, the ringer comprising:

an acoustic transducer for providing an audible output;

oscillatory generator means comprising a first and a second oscillator for activating the acoustic transducer;

the first oscillator providing a transducer activation signal, and the second oscillator providing modulation means for the transducer activation signal;

sensing means for distinguishing between valid and invalid ringing signals applied across the input lines and for applying a ring activation signal to the oscillatory generator means when a valid ringing signal is detected; and

frequency determining means connected to the oscillatory generator means for controlling the frequency of the transducer activation signal provided by the first oscillator, the frequency determining means including a switchable ratio current mirror for providing a control current to the oscillatory generator means, the current mirror providing a plurality of selectable current levels for a corresponding plurality of different frequency transducer activation signals from the oscillatory generator means.

4,567,334

SUSPENDED COMBINED ELECTRIC CURRENT COLLECTION AND TRACTION SYSTEMS

Thomas W. Wilcox, "Delway", 1 Astley Dr., Whitley Bay, Tyne & Wear NE26 4AE, United Kingdom

PCT No. PCT/GB82/00169, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983, PCT Pub. No. WO82/04422, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 8, 1982, Ser. No. 466,341

Claims priority, application United Kingdom, Jun. 9, 1981, 8117654

Int. Cl.[4] B60M *1/08*

U.S. Cl. 191—21 **10 Claims**

1. A track for providing combined electric current and frictional traction for a suspended locomotive, comprising:

an elongate resilient shield,

at least one elongate conductor positioned within said shield,

a plurality of contact segments along the length of said shield, said segments extending from within said shield to

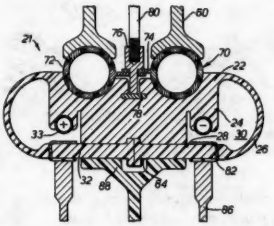
the exterior of said shield and being normally spaced from said conductor within said shield,

at least one flexible elongate reinforcing member connected to said shield for supporting said track,

said at least one flexible elongate reinforcing member having a first exterior surface adapted to engage at least one reaction wheel of a locomotive,

said shield and said contact segments forming a second exterior surface adapted to be frictionally engaged by at least one drive wheel of the locomotive,

said first and second surfaces being on opposed sides of said track,



the zone of said track which is engaged by the reaction wheel and drive wheel of the locomotive compressing by deformation of said shield to cause the ones of said contact segments in said zone to engage said conductor to provide electricity to the locomotive,

said compression of said track and resilient shield causing substantial frictional engagement between said second exterior surface and the drive wheel of the locomotive to provide frictional engagement that drives the locomotive, through the drive wheel, along said second exterior surface.

4,567,335

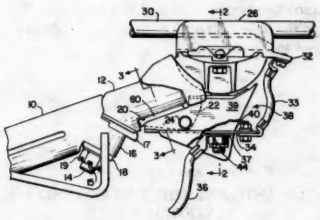
HIGH SPEED TROLLEY HARP ASSEMBLY

Thomas W. Griffiths, Lexington, Ohio, assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jul. 2, 1984, Ser. No. 626,715

Int. Cl.[4] B60L *5/08*

U.S. Cl. 191—59.1 **7 Claims**



1. A high speed trolley harp assembly for use at the upper end of a trolley pole to maintain a current shoe in contact with an elongated conductor comprising the combination of

an upper body attached to the upper end of said pole, said body including a generally tubular sleeve and a central wall protruding therefrom;

a current shoe having a longitudinal recess for contacting a conductor;

support means for supporting said current shoe;

axle means for pivotally connecting said support means to said central wall so that said support means is pivotable relative to said upper body about an axis generally perpendicular to said central wall; and

a body of compressible elastomeric material contained in and protruding from said upper body adjacent said central wall and contacting a surface of said support means to maintain said shoe in contact with said conductor and absorb vibrational energy of said support means as said shoe moves along said conductor.

4,567,336

LOCKING MECHANISM FOR A BIPARTITE KEYBOARD HOUSING

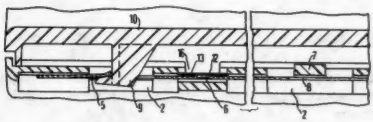
Josef Lemche, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,410

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319334

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—305 **4 Claims**



1. A locking mechanism for a bipartite keyboard housing consisting of upper and lower plastic parts having inwardly disposed shielding, comprising:

an elongated guide channel formed along at least one side of the lower part,

spaced clearances formed in said one side of the lower part to communicate with said channel,

spaced hooks secured to the upper part of the housing extendable into said clearances,

a lock rail disposed in said guide channel, said lock rail being longitudinally displaceable therein and being provided with upwardly bent contact tongues spaced to engage said hooks and with upwardly extending contact humps therebetween,

a web positioned above said channel and aligned with one of said clearaces in the lower part of the keyboard, and

an opening situated in the lock rail, the web and the opening being aligned with one another such that the lock rail is longitudinally displaceable by means of a tool engageable with said web against said opening.

4,567,337

FLEXIBLE EXTENSION DEVICE FOR TOGGLE SWITCHES

Karl E. Woods, I, 625 Cincinnati St., Toledo, Ohio 43611, and Evan Scott, Jr., 822 Anderson St., Northwood, Ohio 43619

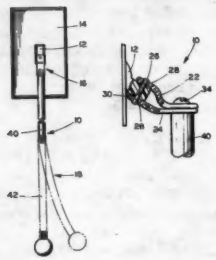
Filed Jan. 3, 1984, Ser. No. 568,031

Int. Cl.[4] H01H *3/04*

U.S. Cl. 200—331 **12 Claims**

1. A light switch extension for facilitating operation of a toggle type wall switch comprising, in combination, means for engaging the switch toggle of a wall switch, said engaging means including a first flexible strap having a first surface for disposition against an upper surface of such toggle, a second flexible strap having a second surface generally parallel to said first surface for disposition against a lower surface of such toggle, means for retaining said engaging means on said toggle, said retaining means defining a first axis disposed normal to said first and said second surfaces, said engaging means further including a terminal portion and a flexible intermediate portion disposed between said first and second surfaces and said terminal portion, and an elongate operator means coupled to said terminal portion for applying bi-directional force to such toggle, said operator means including a rigid portion and a helical

spring coupled to said rigid portion and defining a second axis for bi-directionally transferring forces applied substantially



along said second axis and deforming in response to forces applied obliquely and perpendicularly to said axis.

4,567,338

CUP-SHAPED SWITCH CONTACT MEMBER FOR AN ELECTRIC VACUUM SWITCH

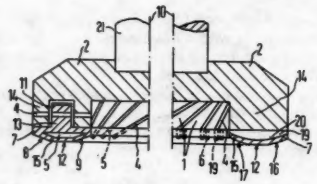
Gerhard Peche, Romrod, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,721

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323627

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **15 Claims**



1. Cup-shaped switch contact member for an electric vacuum switch having a lead post, a bottom connected to the lead post, a cylinder wall connected to the bottom, and a contact ring secured to the cylinder wall and formed of a material favoring interruption of an arc having a lower conductivity than that of the cylinder wall, the lead post having a diameter smaller than the inner diameter of the cylinder wall, the cylinder wall and the contact ring being at least partly slotted, the slots formed in the clinder wall extending at an angle to the axis of rotation of the switch contact member and merging with the slots formed in the contact ring, comprising a contact surface formed on the contact ring and having a pair of concentric annular zones overlying respective radially inner and radially outer marginal regions of an annular end face of the cylinder wall, said contact surface also having a middle annular zone disposed between said concentric annular zones and being farther removed from the cylinder wall than either of said concentric annular zones, a layer of the material of the contact ring having a thickness approximately equal to a depth of maximum melting occurring during switch-off or disconnection of the switch contact member, said layer being disposed in vicinity of the slots formed in the contact ring and extending continuously along said contact surface without being slotted, the contact ring being of such thickness as to be able to absorb maximum bending forces occurring during closing or switch-on of the switch contact member without impermissible deformation.

4,567,339

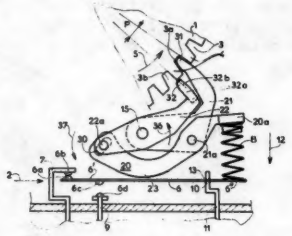
CAM OPERATED CONTROL DEVICE OF AN ELECTRICAL SWITCH

Jean Monie, Cluses, France, assignor to Societe Industrielle de Bellevaux, SIBEL, Cluses, France

Filed Jul. 6, 1984, Ser. No. 628,338

Int. Cl.⁴ H01H *19/62*

U.S. Cl. 200—153 LB **7 Claims**



1. A control device incorporating at least one electrical switch (2; 40) which can be actuated abruptly, for closing and opening, by a single rotary control cam (1), the said device incorporating a control cam (1) comprising a plurality of identical abrupt-drop notches (3) separated respectively by solid parts (4) identical to one another, and a lever system serving as an intermediary between the control cam (1) and the switch and comprising a first and a second lever (21, 22), each of which pivots about a fixed axle (15; 15*a*, 15*b*) and each of which possesses a nose (31, 32) intended to interact under the action of at least one elastic means (8; 8', 51) with the profile of the control cam (1), a link (20) being articulated, on the first lever (21) and, on the second lever (22) at points (21*a*, 22*a*) separate from the fixed pivot axles of the said levers, one of these points of articulation sliding in the link or in the respective lever in a direction transverse to the direction of displacement of the noses of the two levers, the respective noses (31, 32) of the two levers (21, 22) having such dimensions and positioned in such a way that the nose (31) of the first lever can drop into any one notch (3) of the control cam (1) a moment before the nose (32) of the second lever, said link (20) possessing a relief part (23) which is arranged opposite the switch and which has such dimensions and is positioned in such a way that it respectively opens and closes the switch abruptly when the nose (31) of the first lever abruptly drops into any one of the notches (3), and that it respectively closes and opens the switch abruptly when the nose (32) of the second lever abruptly drops into any one of the notches (3).

4,567,340

APPARATUS AND METHOD FOR DRYING SOLID MATERIALS

John W. Latchum, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 9, 1985, Ser. No. 690,084

Int. Cl.⁴ H05B *6/68, 6/60*

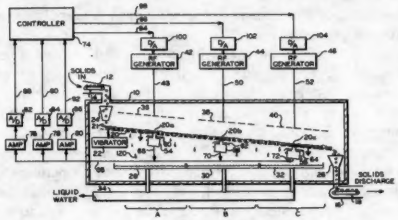
U.S. Cl. 219—10.41 **10 Claims**

5. A method of drying a solid material containing water comprising:

generating a radio frequency electromagnetic field in the vicinity of the solid material;

detecting the amount of moisture on the surface of the solid material, the surface moisture so detected being denoted as the surface moisture content;

controlling the field in response to said surface moisture detection so as to maintain a condition wherein water is



expelled from the solid material substantially as a liquid, and

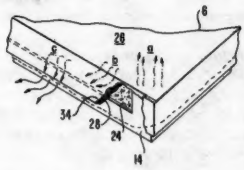
collecting the liquid water expelled by the solid material.

4,567,341

SIDE VENTED AND SHIELDED MICROWAVE PIZZA CARTON

Richard K. Brown, Appleton, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Filed Aug. 2, 1984, Ser. No. 637,056
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 E **11 Claims**



1. A carton for use in heating food in a microwave oven, comprising:

(a) a bottom portion having a bottom panel and at least a first side wall connected with and extending upwardly from said bottom panel;

(b) a top portion cooperating with said bottom portion to enclose a food receiving cavity, said top portion including a top panel and a second side wall panel connected with and extending downwardly from said top panel in laterally spaced apart relationship with said first side wall panel to form a generally vertically oriented passage;

(c) microwave reflecting means for reducing the amount of microwave energy entering the food receiving cavity through said top portion, said microwave reflecting means including a layer of microwave impervious material associated with said top portion; and

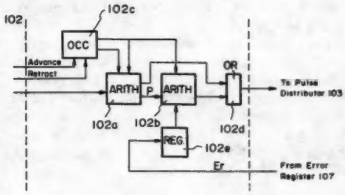
(d) vapor escape passage means for causing vapor generated within the food receiving cavity to be vented to the exterior of the carton by passing through said vertically oriented passage formed between said first and second side wall panels without passing through said microwave impervious layer.

4,567,342

METHOD AND APPARATUS FOR CONTROLLING DIRECTION REVERSAL IN ELECTRIC DISCHARGE MACHINES

Ryoichiro Nozawa, Tokyo; Mitsuo Kinoshita, and Teruyuki Matsumura, both of Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Jun. 24, 1983, Ser. No. 507,494
Claims priority, application Japan, Jun. 24, 1982, 57-108866
Int. Cl.[4] B23P *1/12*; G05B *9/02*
U.S. Cl. 219—69 M **13 Claims**



1. A method of reversing a feed direction of an electric discharge machine having an electrode which is moved relative to a conductive workpiece in response to a command signal from a control means having an error computing and storing means for controlling the electrode, an arithmetic difference between the value of the command signal and a number of pulses, each of which is generated for each prescribed increment of movement of the electrode, is computed and stored as an error in the error computing and storing means, and the electrode is subsequently driven in accordance with the error stored in the error computing and storing means, the electrode machining the workpiece by an electric discharge developed across the electrode and the workpiece, said method comprising the steps of:

(a) generating, as the command signal in response to a short-circuit signal produced when the electrode contacts the workpiece, a reversal command value larger than the error stored in the error computing and storing means; and

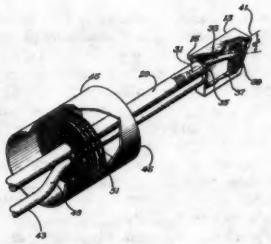
(b) converting, using the reversal command value generated in step (a), the error stored in the error computing and storing means into a value for immediately reversing the direction of the electrice discharge machine.

4,567,343

WELDING TORCH WITH DUAL GAS SHIELDING

Eric C. Sullivan, and Daniel W. Allford, both of Houston, Tex., assignors to Hughes Tool Company - USA, Houston, Tex.

Continuation-in-part of Ser. No. 607,091, May 4, 1984, abandoned. This application Mar. 13, 1985, Ser. No. 710,000
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—74 **7 Claims**



1. A welding torch with improved gas shielding to prevent

atmospheric contamination or oxidation of the weld area for welds in confined spaces comprising:

a primary gas chamber having a diffusing wall therein;

a wire conduit adapted to receive a continuously advanced supply of welding wire, said wire conduit having an end portion mounted within said diffusing wall at an angle to the axis of said wire being advanced through said wire conduit to thereby change the direction of said welding wire being advanced through said wire conduit;

a primary gas conduit connected to said primary gas chamber for supplying pressurized gas to said chamber, said primary pressurized gas passing through said diffusing wall around said wire conduit to shield said welding wire during welding;

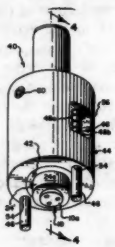
secondary shield gas means for supplying pressurized gas in the direction of said weld, said primary gas conduit being arranged to extend from within the direction of flow of said secondary shield gas means so that the flow of the secondary shield gas surrounds the flow of the primary shield gas and the flow of primary shield gas induces a change in direction in the flow of the secondary shield gas to further shield the weld area.

4,567,344

APPARATUS AND METHOD FOR WELDING A STUD TO THE SURFACE OF A WORKPIECE

William L. Michalski, Jr., 15 Springdale Ave., Jamestown, N.Y. 14701

Filed Aug. 27, 1984, Ser. No. 644,700
Int. Cl.[4] B23K *9/20*
U.S. Cl. 219—98 **9 Claims**



1. A stud supporting and positioning unit for use with welding apparatus and in cooperation with a template having a pair of guide holes arranged adjacent a clearance opening for weld affixing a head end of a stud to a surface of a workpiece such that a shank end of said stud is disposed to upstand from said workpiece at a location defined by said guide holes, said unit including in combination:

a welding electrode having a bore opening through one end of said electrode for removably mounting said shank end of said stud with said head end disposed outwardly beyond said one end of said electrode, said electrode having an opposite end for mounting said unit on said welding apparatus;

electrical insulating means supported by said electrode;

a casing supported by said insulating means;

a pair of guide pins supported by said casing for reciprocating movement along paths of travel arranged parallel to said bore between an extended position and a retracted position, said guide pins having guide ends thereof projecting from said casing which are sized and spaced apart for receipt within said guide holes and arranged relative to said bore to position said one end of said electrode in alignment with said clearance opening when said guide pins are received within said guide holes, said casing is fixed in position axially of said electrode, whereby when said guide pins are in said extended position and said shank end of said stud is fully seated within said bore opening, said guide ends are disposed outwardly beyond said head end of said stud, said retracted position of said guide pins is determined by engagement of said head end of said stud with said surface of said workpiece; and

spring means for biasing said guide pins toward said extended position.

7. In a method of weld affixing a head end of a stud to a surface of a workpiece with a shank end of said stud arranged in alignment with a location on said surface of said workpiece, which employs a welding electrode provided with a bore opening for releasably supporting said shank end of said stud and a template removably fixed in engagement with said surface of said workpiece and formed with through openings for permitting passage of said head end of said stud through said template for engagement with said surface of said workpiece and alignment of said shank end of said stud with said location, as said electrode and said workpiece are moved relatively towards one another, the improvement comprising:

supporting a pair of guide pins on said electrode in an electrically non-conductive relationship therewith and with said guide pins arranged parallel to said bore opening and having a given spacing and orientation relative to said bore opening and said shank end of a stud supported therewithin;

forming a pilot hole in said template for alignment with said location;

using said pilot hole as a guide for forming a pair of guide holes sized to slidably receive said guide pins and having a given spacing and orientation relative to said location corresponding to said given spacing and orientation of said guide pins relative to said bore opening;

increasing the size of said pilot hole to define a clearance hole of a size and shape sufficient to prevent contact of said head end of said stud and said electrode with said template when said head end of said stud is passed through said clearance hole for engagement with said surface of said workpiece and said shank end of said stud is disposed in alignment with said location;

removably fixing said template in engagement with said surface of said workpiece to position said guide holes in said given spacing and orientation relative to said location; and

inserting said guide pins in said guide holes to constrain said shank end of said stud for alignment with said location incident to moving said electrode and said workpiece relatively towards one another to pass said head end of said stud through said clearance hole for engagement with said surface of said workpiece.

4,567,345

PROCESS AND APPARATUS FOR THE IN-LINE INSPECTION OF THE DEPTH OF A WELD BY A PULSE BEAM

Bernard Bachet, Marsonnay la Côte; Jean Daguet, Dijon, and Louis Dujardin, Fontaine les Dijon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

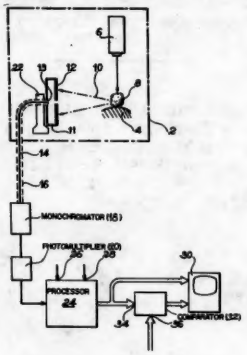
Filed Dec. 12, 1983, Ser. No. 560,580
Claims priority, application France, Dec. 17, 1982, 82 21206
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PT **10 Claims**

1. A process for the in-line inspection of the depth of a weld carried out by a pulse beam in which, around its impact point on a workpiece consisting of one or more components, the pulse beam produces a welding plasma, said process comprising the steps of

optically collecting only during the emission of a welding beam pulse at least one selected monochromatic emission line of the welding plasma from a major component of said workpiece;

converting the energy of said lines into analog electrical signals;

digitally processing said analog signals;



generating reference signals; and

comparing said processed signals with said reference signals to produce an indication of the depth of said weld.

4,567,346

ARC-STRIKING METHOD FOR A WELDING OR CUTTING TORCH AND A TORCH ADAPTED TO CARRY OUT SAID METHOD

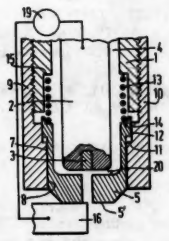
Gérard Marhic, Cergy, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 19, 1984, Ser. No. 672,503

Claims priority, application France, Dec. 7, 1983, 83 19554

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219--121 PB **10 Claims**



1. A cutting or welding torch for connection to an electric current source, the torch comprising a torch body, a metal nozzle mounted in said body and defining an orifice for guiding a gas, the nozzle being structurally isolated from said current source, an electrode coaxially disposed inside said nozzle and in alignment with said orifice, said electrode and said nozzle being mounted in said torch body in such manner as to be mutually axially movable between a maximum spacing position corresponding to a normal spacing in operation and a position of mutual contact, to provide freely slidable movement of said nozzle and said body, and resilient yieldable means cooperable with said nozzle for biasing said nozzle to a position in which it is spaced at a maximum distance from said electrode.

4,567,347

MEASUREMENT HEAD FOR WELDING MACHINES

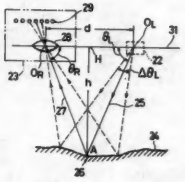
Giichi Ito, Koganei; Ichizo Nakano, Kanagawa; Yuichi Shimizu, Koganei; Kosaku Mukai, Tokyo, and Saiju Suzuki, Chofu, all of Japan, assignors to NTT Gijutsu Iten Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,651

Claims priority, application Japan, Dec. 15, 1983, 58-237476

Int. Cl.⁴ B23K *9/10*

U.S. Cl. 219—124.34 **23 Claims**



1. A measurement equipment for welding machines, comprising:

(a) a head body;

(b) light-emitting means mounted on said head body for projecting a laser light beam onto a surface of an object to form a bright spot thereon;

(c) modulating means for modulating the light intensity of said laser light beam with a modulating signal having a frequency of at least 50 KHz;

(d) means for periodically sweeping said laser light beam in a sweep plane so that a first angle at which said laser light beam is projected from said light-emitting means is changed during each sweep of said laser light beam;

(e) light receiving means mounted on said head body at a predetermined distance from said light-emitting means for detecting reflected light from said bright spot on the surface of said object and for converting the detected light into an electric signal, said light receiving means comprising a light receiving lens system for forming an image of said bright spot on an image forming plane of said lens system, and a linear array of photodiodes disposed in said image forming plane of said light receiving lens system, the line of said array lying in said sweep plane so that said image of the bright spot always lies on the line on which said linear array of photodiodes lies;

(f) scanning means for successively scanning the respective photodiodes of said array and successively deriving therefrom outputs as said electric signal so that a second angle at which said image of said bright spot is detected by said array of photodiodes is successively changed;

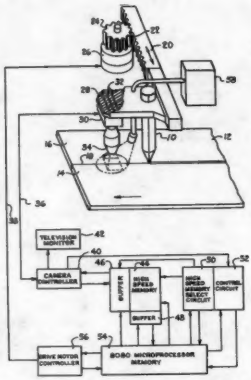
(g) demodulating means for demodulating a modulated component of said laser light beam from said electric signal supplied from said scanning means; and

(h) processing means for detecting a set of said first and second angles each time said modulated component of the light beam is derived from the output of said demodulating means and for computing successive positions of said bright spot on the surface of said object for each sweep of said laser light beam based on the principle of triangulation using the corresponding sets of said detected first and second angles in accordance with a predetermined program.

4,567,348
AUTOMATED WELD TORCH GUIDANCE CONTROL SYSTEM

Hubert E. Smith; William A. Wall, and Morrison R. Burns, Jr., all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 460,733, Jan. 25, 1983, abandoned. This application Dec. 27, 1984, Ser. No. 685,607
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.34 16 Claims



13. An apparatus for controlling the movement of a welding implement so that said welding implement is properly positioned relative to a joint of a work piece to be welded, comprising:

a movable support member adapted to be placed in a cross position of the joint to be welded:

a welding implement carried by said support member;

a camera means carried by said support member and adapter to track the joint to be welded;

said camera means having light sensing video elements arranged in a two-dimensional matrix of rows and columns which have a predetermined spaced position relative to one another to provide known tracking positions including a reference position, said reference position consisting of a single prescribed reference video element in a single prescribed row of said two-dimensional matrix, said video elements adapted to generate individual voltages according to the intensity of light incident on each of said light sensing video elements;

converting means for changing the individual voltages of said sensing video elements of said camera means into digital tracking information representing said tracking positions in said single prescribed row;

a light means carried by said support member, and adapted to direct a constant solid light onto an area about and including the joint of a work piece to be welded;

said joint is characterized by reflecting less light toward said camera means as compared with the surrounding area;

processor means for receiving said digital information representing the light intensity levels incident upon said light sensing video elements of said camera means and determining the positions of said light sensing video elements upon which said reflected light from said joint is incident upon and determining from said tracking information only from said prescribed row a deviation of said welding implement from said prescribed reference video element and the location of the joint to be welded, and for producing an error signal representative of the distance of said welding implement from its desired location relative to the joint to be welded;

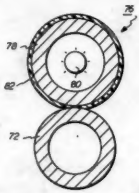
actuating means for causing said support member to move in a cross direction to the joint to be welded;

said actuating means being activated by said error signal of said processor means so as to position said welding implement at a desired location relative to the joint to be welded.

4,567,349
HEAT AND PRESSURE FUSER APPARATUS

Arnold W. Henry, Pittsford, and Rabin Moser, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 15, 1982, Ser. No. 441,583
Int. Cl.[4] G03G *15/20*
U.S. Cl. 219—216 9 Claims



1. Heat and pressure fuser apparatus for fixing toner images to a copy substrate, said apparatus comprising:

a fuser member comprising a rigid metal core overcoated only with a solid abhesive material, the material being selected from the group consisting of fluorinated polymers and copolymers;

means for elevating the surface temperature of said fuser member;

a backup member adapted to be pressure engaged with said fuser member to thereby form a nip between the two members, said fuser member being deformable by said backup member whereby said fuser member contributes to the formation of said nip;

and means for conveying copy substrates through said nip without applying release agent material to said fuser member.

4,567,350
COMPACT HIGH FLOW RATE ELECTRIC INSTANTANEOUS WATER HEATER

Alvin E. Todd Jr., P. O. Box 924 Vickwood Hills, Pigeon Forge, Tenn. 37863

Filed Jan. 6, 1983, Ser. No. 456,327
Int. Cl.[4] H05B *1/02, 3/82;* F24H *1/10*
U.S. Cl. 219—298 7 Claims

1. An instantaneous-type water heating apparatus comprising, in combination,

a cold water input pipe,

a hot water output pipe,

a plurality of water heating chambers connected in series flow relationship between the cold water input pipe and the hot water output pipe, said heating chambers having electrical heating elements for heating the water flowing through the chambers,

means in series flow relationship between each adjacent pair of water heating chambers for mixing the water and temporarily storing and exchanging heat as the water flows from one chamber to the next in the series of chambers so that the water tends to be evenly heated,

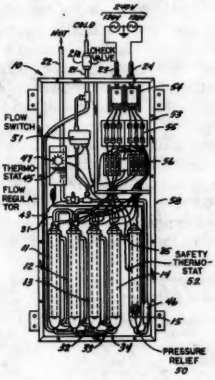
means responsive to the flow of water from the cold water input pipe through the heating chambers to the hot water output pipe for activating a flow switch in response to the flow exceeding a predetermined threshold,

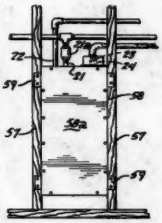
means responsive to the temperature of the water flowing out the hot water output pipe for activating a thermostat

switch in response to the temperature exceeding a preset adjustable threshold temperature, and

means for connecting the heating elements to a source of electrical power in reponse to the flow switch and the thermostat switch being simultaneously in their activated state,

wherein the means for connecting the heating elements to a source of electrical power has at least two independent





pairs of switch contacts and separate connections to both the building side and the service side of an electrical utility system supplying said source of electrical power, one pair of the switch contacts connecting at least one of the heating elements to the building side of the electrical utility system, and another pair connecting at least one other of the heating elements to the service side of the electrical utility system.

4,567,351

ELECTRIC SPACE HEATER EMPLOYING A VAPORIZABLE HEAT EXCHANGE FLUID

Yoshiaki Kitagawa, Osaka; Koichiro Ohki, Ibaraki, and Toshio Sarada, Moriguchi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 5, 1983, Ser. No. 520,582

Int. Cl.⁴ H05B *1/02, 3/82;* F24H *3/08;* F24D *13/04*

U.S. Cl. 219—341 **3 Claims**

1. An electric space heater comprising a housing having:

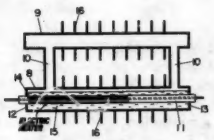
a substantially straight and uniform diameter main tube adapted to be disposed substantially horizontally,

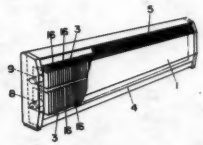
a substantially straight and uniform diameter secondary tube arranged to be above and in substantially parallel relationship with said main tube,

conduit pipe means extending upwardly from the main tube to the secondary tube and interconnecting the tubes to define a closed space within the tubes and conduit pipe means;

an elongated heat source extending axially through only the main tube, said heat source including an elongated protective pipe extending through the length of the main tube and having its end portions sealed respectively in end walls of the main tube and an electric resistance heating element extending the entire length of the protective pipe and having its ends projecting therefrom for connection to a power source, the secondary tube being empty;

a vaporizable working fluid in the space within the main tube and being in liquid phase at the operating tempera-





ture of the apparatus so as to entirely immerse only the heat source in the fluid, but having the remainder of the closed space empty for expansion of vaporized working fluid thereunto;

said main and secondary tubes being provided respectively with radiation fins evenly spaced along the length thereof, with the fins on the secondary tube being spaced at a wider clearance than those on the main tube; and

said working fluid in the main tube absorbing the heat from the heat source to vaporize and expand in all regions of said closed space and condensing on the inner surface forming the closed space so as to give up its latent heat of vaporization to the surrounding air and then returning through the conduit pipe means to the main tube.

4,567,352

FLASHLIGHT-RADIANT APPARATUS

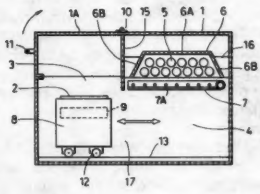
Yoshiki Mimura, Yokohama; Tetsuji Arai, Tachikawa, and Satoru Fukuda, Kawasaki, all of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,260

Claims priority, application Japan, Mar. 29, 1983, 58-51673

Int. Cl.⁴ A21B *1/00, 1/22*

U.S. Cl. 219—405 **5 Claims**



1. A flashlight-radiant apparatus comprising:

a housing defining within an object-handling space and an

irradiation space located adjacent to the object-handling space;

a plurality of flash discharge lamps provided side by side in an upper part of the irradiation space;

a gas-discharging member provided in the upper part of the irradiation space for controlling the atmosphere in the housing; and

an object-supporting table movable reciprocatingly between the object-handling space and the irradiation space in the housing and equipped with built-in subsidiary heating means,

whereby an object supported on the object-supporting table can be preheated while the object-supporting table is located in the object-handling space.

4,567,353

HIGH-ACCURACY TEMPERATURE CONTROL

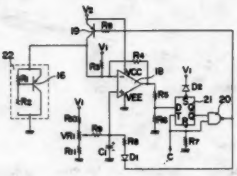
Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 130,998, Mar. 17, 1980, abandoned, which is a continuation of Ser. No. 893,791, Apr. 5, 1978, abandoned. This application Jul. 30, 1984, Ser. No. 634,674

Claims priority, application Japan, Apr. 7, 1977, 52-40086

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—501 **2 Claims**



1. A temperature control means for accurately controlling the temperature of the ink supply in an ink jet printer comprising:

a single power transistor having a base, emitter and collector for generating heat in a heating mode and sensing temperature in a sensing mode, said power transistor producing a temperature related output voltage at its emitter when in said sensing mode and having its collector grounded;

a first resistor interconnecting the emitter and base of said single power transistor;

a second resistor interconnecting the collector and base of said single power transistor;

sensing means, connected to said single power transistor, for monitoring the temperature related output voltage of said single power transistor when in the sensing mode;

a power voltage source developing a heating voltage for application to said single power transistor when in a heating mode;

a switching transistor having a base, emitter and collector, said switching transistor having its emitter connected to said voltage source and its collector connected to said single power transistor, said switching transistor being turned on only when a power application pulse is applied to its base in the heating mode to apply said heating voltage to said single power transistor, said temperature control means being in said sensing mode when said power control signal is not developed;

a sensing voltage source developing a reference voltage representative of the desired temperature of said single power transistor;

a differential amplifier comparator having a first input terminal connected to said single power transistor to receive said temperature related output voltage and having a second input terminal connected to said sensing voltage source to receive said reference voltage, said comparator comparing said temperature related output voltage to said reference voltage and developing a power application signal when said sensed temperature of said single power transistor is less than the desired temperature represented by said reference voltage;

a clock signal generator generating a clock pulse train;

a bistable latch circuit having a toggle input to which said clock pulse train is introduced and having an information input to which said power application signal is introduced, said bistable latch circuit developing a power application pulse at its output when said power application signal is applied to said bistable latch circuit and said clock pulse train produces a clock pulse, said power application pulses being produced only during production of alternate clock pulses by said clock signal generator when said power application signal is present, said power application pulse placing said temperature control means in a heating mode;

a feedback compensation path including a serially connected third resistor and diode having an anode and cathode, the cathode of said diode being connected to the output of said bistable latch circuit, the anode of said diode being connected to said resistor which in turn is connected to said second input terminal of said comparator; and

heat exchanger means for transferring heat from said power transistor means to said ink supply;

said power application pulses being of fixed duration and variable frequency to thereby produce a pulse frequency modulated train of said power application pulse.

4,567,354

ELECTRONIC INSTRUMENT

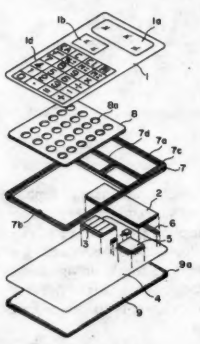
Kazumi Sekine, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 525,211, Aug. 22, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 728,161

Claims priority, application Japan, Aug. 30, 1982, 57-149170

Int. Cl.⁴ G06C *7/02*; H01H *9/26*

U.S. Cl. 235—145 R **7 Claims**



1. An electronic instrument that includes electrical components, said instrument comprising:

a key-input circuit;

a printed circuit substrate on which the electrical components and said key-input circuit are mounted, said substrate havinga front side and a back side;

frame means disposed on said front side of said printed circuit substrate, having a larger area than said printed circuit substrate, and having openings at least at positions corresponding to at least a portion of said electrical components including said key-input circuit;

flexible front sheet means having at least one transparent portion, a front face on which are printed symbols indicating key-input functions, a back face on which are formed electrodes adapted electrically to contact portions of said key-input circuit upon depression of said front sheet means at said printed symbols, and an adhesion area about the periphery thereof; said front sheet means being disposed with said back face in opposition to said front side

of said substrate with said electrodes in opposition to said key-input circuit;

spacing means disposed at least in said opening corresponding to said key-input circuit between said back face of said front sheet means and the front side of said substrate for normally maintaining said electrodes in spaced relation from said key-input circuit when said front sheet means is not depressed;

back sheet means disposed on said back side of said printed circuit substrate and having an adhesion area on the surface thereof opposed to said back side of said substrate; and

an adhesive agent applied to the adhesion areas of said front sheet means and said back sheet means to cause said printed circuit substrate and said frame means to be sandwiched between said front sheet means and said back sheet means.

4,567,355

METHOD AND OPTICAL APPARATUS FOR CONVERTING RESIDUE NUMBERS INTO POSITIONALLY NOTATED NUMBERS

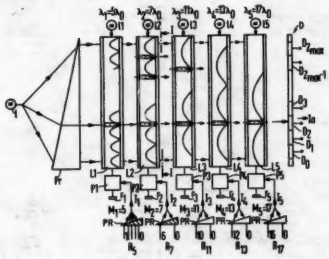
Dieter Schuoecker, Vienna, Austria, and Ekkehard Klement, Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 386,902

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126987

Int. Cl.⁴ G06F *3/00*

U.S. Cl. 235—310 **23 Claims**



1. An optical device for processing residue numbers comprising one unit including an encoder means for converting differently encoded input numbers in parallel into residue numbers by selectively interrupting a plurality of light paths respectively allocated to each possible numeral in said residue number, an arithmetic means for airthmetically operating on said residue numbers, and a decoder means for converting a result of said residue numbers, and a decoder means for converting a result of said arithmetic operation into a positionally notated number, said decoder means comprising a light source and a plurality of linear periodic structures irradiated by said light source having respectively different constant periods for differently modulating light incident thereon and being disposed such that light modulated by each linear period structure is superimposed with light modulated by all of the other linear periodic structures, said linear periodic structures being respectively allocated to each module utilized for said residue numbers, a scale of equidistantly spaced positionally notated numbers on which said modulated light is superimposed, and a means for individually shifting said linear periodic structures with respect to said scale until an end of a period in each linear periodic structure is aligned with an end of a period in each of the other linear periodic structures, the period for each linear periodic structure being the product of the spacing between adjacent positionally notated numbers on said scale and the module allocated to the linear periodic structure and a reading on said scale when said ends of periods are aligned indicating a positionally notated number for said residue number.

4,567,356

PROCESS TO ESTABLISH AND CHECK THE MATCHING OF NEGATIVES AND PROCESSING ENVELOPES IN PHOTOGRAPHIC LABORATORIES

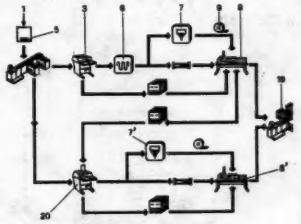
Roberto Signoretto, Olmo di Martellago, Italy, assignor to Photo Engineering International s.r.l., Venice, Italy

Filed Oct. 6, 1983, Ser. No. 539,420

Claims priority, application Italy, Sep. 29, 1983, 84143 A/82

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 235—375 **6 Claims**



1. Process to establish and check matching of negatives and processing envelopes in photographic laboratories, wherein the negatives are of disk type with a bar code preprinted on the film and on the film cartridge, characterised in that:

the bar code printed on the film cartridge is automatically read and reproduced, at least in its significant part, in a machine legible code on the envelope (1),

the envelope (1) is separated from the cartridge and the film (2), extracted from this, is dispatched to the traditional developing and printing operations, and

an automatic comparison is carried out between the bar code (4) preprinted on the film (2) and the machine legible code reproduced on the envelope (1).

4,567,357

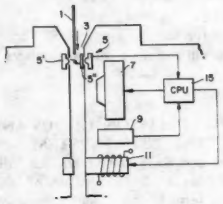
METHOD OF AND APPARATUS FOR AUTOMATIC LINE IDENTIFICATION FOR RECORDING ON EMPLOYEE TIME CARDS AND THE LIKE

Vincent Fedele, Concord, Mass., assignor to Kronos Incorporated, Boston, Mass.

Filed May 6, 1983, Ser. No. 492,401

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 235—377 **2 Claims**



1. In a time card recording apparatus having card receiving, clamping and printing means, the improvement of means carried by the printing means to print distinctive line-identifying marks as well as time-in and time-out data entries on successive lines, one mark for time-in and a second for time-out; and means disposed as the card is presented to the receiving means,

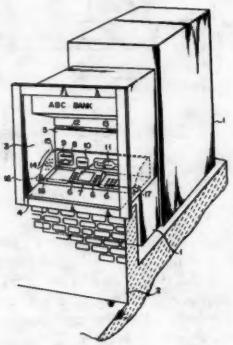
for sensing the presence of both marks and, in the event one mark only is present, actuating the clamping means on the same line as said one mark so that the next print by the printing means is on the same line; and, if both marks are present, actuating the clamping means to clamp the card at the next line.

4,567,358

AUTOMATIC TELLER SYSTEM

Satoru Takamatsu, and Takashi Sugimura, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 17, 1983, Ser. No. 542,606
Claims priority, application Japan, Oct. 18, 1982, 57-182541
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **6 Claims**



1. An automatic teller system comprising:
an automatic teller machine having means to read out a key number recorded on a recording medium, for automatically performing transactions such as a deposit and a payment;
an electronic data processing center, connected to said automatic teller machine and having a memory for storing a plurality of accounting numbers associated with said key number, for reading out said plurality of accounting numbers from said memory upon receipt of said key number;
first transmitting means, provided at the automatic teller machine side, for transmitting said key number to said electronic data processing center;
second transmitting means, provided at the electronic data processing center side, for transmitting said plurality of accounting numbers, associated with said key number, to said automatic teller machine;
displaying means for displaying said plurality of accounting numbers; and
selecting means for selecting a desired accounting number from said plurality of accounting numbers.

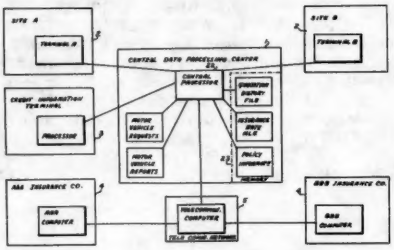
4,567,359

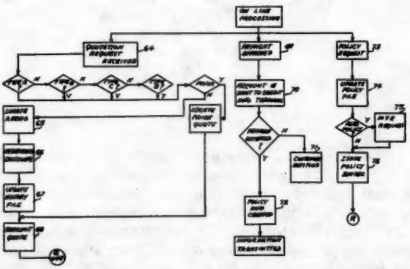
AUTOMATIC INFORMATION, GOODS AND SERVICES DISPENSING SYSTEM

Lawrence B. Lockwood, 5935 Folsom Dr., La Jolla, Calif. 92037

Filed May 24, 1984, Ser. No. 613,525
The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.
Int. Cl.[4] G06F *15/00, 15/30*
U.S. Cl. 235—381 **8 Claims**

1. A system for automatically dispensing information, goods, and services for a plurality of institutions in a particular industry, comprising:
a central data processing center including means for storing service and price rate information for each institution and customer sales information;
at least one customer sales and information terminal including means for dispensing information and services to a customer and means for remotely linking said terminal to said central data processing center and for transmitting data back and forth between said data processing center and terminal; and
a data processing terminal associated with each institution and means for remotely linking each terminal to said central data processing center comprising means for transmitting information back and forth between said data processing terminal and said central data processing center, each data processing terminal including means for storing institution service and price rate information and customer sales information, and input means for user input of up-dated service and price rate information;
said sales and information terminal including:
audio-visual means for interaction with a customer, comprising:





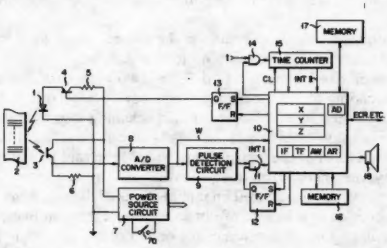
means for storing a sequence of audio and video information to be selectively transmitted to a customer;
means for transmitting a selected sequence of said stored information to the customer;
customer operated input means for gathering information from a customer and for accepting customer orders for goods and services; and
means for controlling said storing and transmitting means in response to customer input to transmit a selected sequence of information to the customer;
said sales terminal further including:
means for storing information and orders input by a customer;
means for transmitting said information and customer orders via said remote linking means to said central data processing center;
means for receiving data comprising customer selected information and processed customer orders for services from said data processing center via said linking means;

means responsive to said data receiving means for dispensing information and services to the customer;
and means for directing the operation of said audio visual means, data receiving and transmitting means, and dispensing means comprising means for holding an operational sequencing list and means responsive to the status of the various means for controlling their operation;
said central data processing center including:
means responsive to data received from said sales terminal for transmitting selected stored information to said terminal via said linking means;
means responsive to a customer sales order from said sales terminal for up-dating said sales information in said storage means, and transmitting said order to said terminal via said linking means for dispensing of the ordered services;
means for periodically accessing said institution terminals via said linking means for transmitting customer sales information for each institution to its associated terminal, and means for periodically accessing said institution linking means for collecting and storing service and price rate information from each institution terminal.

4,567,360
OPTICAL READING APPARATUS

Shigeru Yamada, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,436
Claims priority, application Japan, Oct. 20, 1982, 57-182736
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 235—455 **9 Claims**



1. An optical reading apparatus comprising:
a light source for emiting light for illuminating a recording medium on which data is recorded;
a light receiving unit for receiving the light reflected from said recording medium and for generating an electrical output signal corresponding to the amount of light;
light source driving means connected to said light source for driving said light source;
detecting means connected to said light receiving unit for detecting the level of the output signal of said light receiving unit and for generating a signal every time the level of the output signal of said light receiving unit changes;
time counting means for counting clock pulses and producing an output signal upon reaching a predetermined count;
memory means for storing data;
processing means including:
first flag register means for storing data for a predetermined time after receiving said output signal from said counting means, during which said driving means drives said light source;
second flag register means coupled to said light receiving unit for storing an indication that data is being read from said recording medium, and
means connected to said detecting means, said time counting means and said memory means for counting with said time counting means the duration of signals from said detecting means representative of the data being read from said recording medium, for causing said memory means to store counts from said counting means in response to said signals from said detecting means, for detecting that all data from said recording medium has been stored in said memory means, and upon detecting such storage for analyzing the counts stored in said memory means to determine if they represent valid data.

4,567,361
RETICLE BAR CODE AND METHOD AND APPARATUS FOR READING SAME

David Rosenthal, Lexington, Mass., assignor to GCA Corporation, Bedford, Mass.

Filed May 23, 1983, Ser. No. 496,819
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 235—462 **3 Claims**

1. A reticle carrying a pattern for the microlithographic manufacture of integrated circuit devices having along one side thereof a bar code of light and dark bars including a succession of identifier characters identifying the pattern, said light and dark bars representing opposite polarities, said bar code comprising:
at each end of said code, a quiet zone being a dark bar of a width greater than the maximum allowable width of a bar;
adjacent each quiet zone, a synchronization block comprising a series of predetermined length of bars of equal nominal width and of alternating polarity;
adjacent one synchronization block, a preselected start character which is a terminator character distinct from any of said identifier characters;
adjacent the other synchronization block, a preselected stop character which is a terminator character distinct from any of said identifier characters;
between said terminator characters, a succession of identifier characters, each of said characters comprising three bars of each polarity, the width of each bar being an integral multiple of said nominal width, each character being ten times said nominal width, the number of width units of a given polarity in each character conforms to a preselected parity; and
adjacent said stop terminator characters, a check character, said check character having a value which is a function of the value of all the identifier characters.

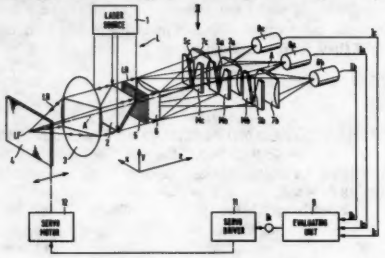
4,567,362
PROCESS AND APPARATUS FOR THE FOCUSING OF A BEAM OF LIGHT ON AN OBJECT

Rino E. Kunz, Steinmaur, Switzerland, assignor to GRETAG Aktiengesellschaft, Regensdorf, Switzerland

Filed Jun. 15, 1983, Ser. No. 504,602
Claims priority, application Switzerland, Jun. 25, 1982, 3923/82
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—201 **42 Claims**

1. A process for focusing a light beam, in particular a laser beam, on an object, comprising the steps of producing by means of an optical system at least two images of a beam spot formed by the light beam on the object, providing a measuring diaphragm associated with each of said at least two images, said diaphragm being located in different positions relative to the desired position of the image of the beam spot in the case of optimum focusing, evaluating the intensities of the light not

blocked out by the measuring diaphragms as a measure of focusing, and adjusting the focusing of the light beam in response to the evaluation, said at least two images of the beam spot being produced by means of a diffraction grating.

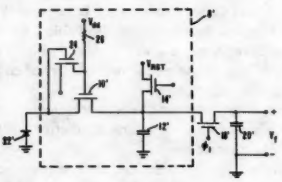


4,567,363

SWITCHED CAPACITOR TRANSRESISTANCE AMPLIFIER

Mark A. Goodnough, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 20, 1983, Ser. No. 505,633
Int. Cl.[4] H01J 40/14
U.S. Cl. 250—214 A 9 Claims



1. A transresistance amplifier for measuring the amount of current flowing to a photovoltaic detector such that the average voltage across said detector is maintained at a value to minimize the electrical noise associated with said detector comprising:

a first MOSFET amplifier having a gate electrode and drain and source terminals;

a first MOSFET switch coupled to the drain terminal of said first MOSFET amplifier;

a first capacitor coupled to the drain terminal of said first amplifier, a switching signal of frequency f_s being coupled to said first switch for enabling a first source of voltage to be connected to said first capacitor for a first portion of said switching signal frequency cycle, the voltage across said first capacitor during the remaining portion of said cycle representing the current flowing to said detector through said first amplifier;

a second MOSFET amplifier having a gate electrode and drain and source terminals, the drain terminal of said second amplifier being connected to the gate electrode of said first amplifier, the gate electrode of said second amplifier being connected to said detector;

a second MOSFET switch coupled to the drain terminal of said second amplifier; and

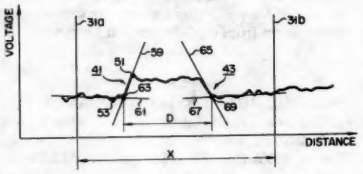
a second capacitor coupled to the output of said second amplifier, said switching signal being coupled to said second switch means for enabling a second source of voltage to be connected to said second capacitor for said first portion of said switching signal frequency cycle, the current flowing through said first amplifier being controlled in a manner such that the average current over a cycle of said switching frequency is of a value to maintain the average value of said detector voltage at said noise minimization value.

4,567,364

METHOD AND APPARATUS FOR MEASURING DIMENSION OF SECONDARY ELECTRON EMISSION OBJECT

Masaaki Kano, Kamakura; Hiroshi Yamaji, Yokohama; Shinji Nakao, Yokohama, and Katsuya Okumura, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,717
Claims priority, application Japan, Nov. 29, 1982, 57-207698
Int. Cl.[4] G01N 23/00
U.S. Cl. 250—307 10 Claims



1. A method for measuring the dimensions of an object to be measured, which is included in a sample, comprising the steps of:

scanning an electron beam on the sample so as to obtain an image signal corresponding to the sample;

obtaining reference points defining two ends of a line corresponding to the dimension of the object in accordance with the image signal obtained in said scanning step by obtaining regression lines which in combination linearly calibrate a waveform of the image signal obtained in said scanning step by the method of least squares, and by determining the reference points based on intersections of the regression lines obtained in said step of obtaining the regression lines; and

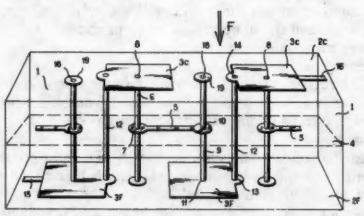
calculating the dimension of the object of the sample in accordance with the reference points obtained in said obtaining step.

4,567,365

SENSOR OF ENERGY FLUX, IN PARTICULAR HEAT FLUX AND VISIBLE AND INFRARED RADIATION

Michel Degenne, Clermont, France, assignor to Isover Saint-Gobain, Courbevoie, France

Filed Aug. 30, 1983, Ser. No. 527,843
Claims priority, application France, Aug. 30, 1982, 82 14767
Int. Cl.[4] H01L 27/16; G01J 5/14
U.S. Cl. 250—338 20 Claims



1. An energy flux sensor, comprising:

a substrate of a thermal and electrical insulating material, said substrate having on each of first and second faces

thereof, parallel and perpendicular to a flux, a plurality of first and second plates of a first metal or alloy, and having a first and second plurality of holes formed in said substrate, said first plurality of holes each respectively connecting one of said plurality of first plates solely to one of said plurality of second plates wherein walls of said first plurality of holes are coated with said first metal or alloy; and

a plurality of separate connecting elements positioned in said substrate, and parallel to said first and second faces, wherein said separate connecting elements each further comprise a second metal or alloy having thermoelectric properties in relation to said first metal or alloy, and wherein said connecting elements include first and second points, constituting hot and cold junctions, respectively, of a thermocouple, said first and second points being respectively connected to said first and second plurality of plates by a coating of said first metal or alloy on walls of said second plurality of holes formed in said substrate and joining each of said hot and cold junctions to said first and second plates such that said first and second plates are connected by said coating on said walls of said second plurality of holes and the connecting elements.

4,567,366

METHOD AND APPARATUS FOR MEASURING METHANE CONCENTRATION IN GAS

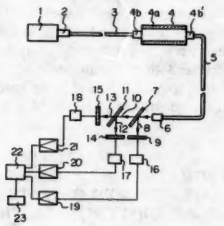
Akio Shinohara, Fujisawa, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 536,051

Claims priority, application Japan, Sep. 25, 1982, 57-166836; May 18, 1983, 58-86770; Jul. 28, 1983, 58-136727

Int. Cl.⁴ G01J *5/08*

U.S. Cl. 250—339 **14 Claims**



1. A method for measuring the methane concentration in a gas, which comprises:

transmitting light having at least one wavelength band selected from a band of 1.6 μm and a band of 1.3 μm through an optical fiber having a small transmission loss in said wavelength bands to a measuring cell where a gas whose methane concentration is to be measured passes in and out,

absorbing the light in at least one characteristic absorption wavelength of methane gas, selected from a wavelength of 1.666 μm and a wavelength of 1.331 μm, in said measuring cell,

transmitting light passing through the measuring cell through an optical fiber having a small transmission loss in at least one wavelength band selected from a band of 1.6 μm and a band of 1.3 μm to a band-pass filter,

separating the light into at least one light having the methane gas absorption wavelength, to be measured, and at least two lights having other reference wavelengths,

determining the intensity ratio of the light having the wavelength to be measured to the lights having the reference wavelengths, and

calculating the methane gas concentration in the measuring cell from the so-determined intensity ratio.

4,567,367

METHOD FOR DETECTING A SOURCE OF HEAT, MORE PARTICULARLY A FOREST FIRE IN A WATCHED AREA, AND SYSTEM FOR CARRYING OUT SAID METHOD

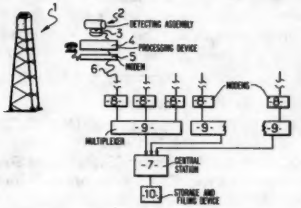
Francois P. D. Brown de Colstoun, 3 rue Joseph Bernard, 92100 Boulogne-Billancourt; Jean-Paul Chambaret, 161 Ave. Paul-Vaillant Couturier, 94250 Gentilly; Yves Chambaret, 77 Ave. Parmentier, 75011 Paris; Arnaud G. Le Saige de la Villesbrunne, 4 Blvd. du Roi, 78000 Versailles; Jean-Claude M. Moscovici, 68 rue de Bourgogne, 75005 Paris, and Michel Moscovici, 176 rue Théodore Honoré 94130 Nogent sur Marne, all of, France

Filed Jan. 12, 1984, Ser. No. 570,198

Claims priority, application France, Jan. 13, 1983, 83 00461

Int. Cl.⁴ G01J *1/00*; G08B *26/00, 17/12*

U.S. Cl. 250—340 **19 Claims**



1. A method for detecting sources of heat, more particularly forest fires in an area particularly of great extent, according to which said area is watched from at least one watching station having an infra-red detector detecting an infra-red radiation emitted by each source of heat and a device connected to the detector for processing and transmitting an information relating to the intensity of the received infra-red radiation of a detected source of heat; the information relating to the detected source of heat being transmitted to a central station through a transmission link, such as a telephone link; and the location of said source of heat being determined at said central station in accordance with the information received from the watching station, said infra-red detector being caused to accomplish, periodically and preferably permanently, angular movements for scanning the area to be watched; said method comprising the steps of:

transmitting to the central station through the transmission links the information relating to all the sources of heat detected by the infra-red detectors;

previously storing at the central station information relating to known sources of heat not to be taken into account;

automatically comparing at the central station each information received from all the infra-red detectors to the information previously stored at the central station;

determining the newly born sources of heat from the results of the comparison; and

emitting an alarm signal when at least one newly born source of heat is determined.

4,567,368

BIPOLAR PULSED ELECTRON CAPTURE DETECTORS

Gregory J. Wells, Suisan, and Richard K. Simon, Pittsburg, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 19, 1984, Ser. No. 571,989

Int. Cl.⁴ G01N *27/66*

U.S. Cl. 250—379 **30 Claims**

1. An electron capture detector comprising:

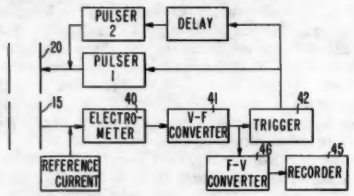
means defining a detection volume for accepting a carrier gas and a vaporized sample to be analyzed;

an anode communicating with said detection volume;

means for continuously ionizing said carrier gas to continuously produce free electrons in said volume, said free

electrons being available for attachment to said sample to produce anions;

means for applying to said detection volume a first electric pulse to move electrons toward said anode;



means for applying to said detection volume a second electric pulse following said first pulse sufficient to disperse anions away from said anode, but insufficient to clear said detection volume of said anions.

4,567,369

CORRECTION OF ASTIGMATISM IN ELECTRON BEAM INSTRUMENTS

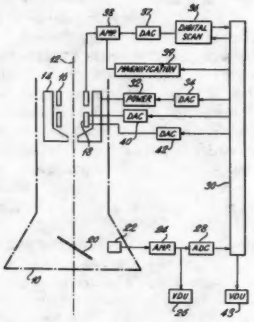
Kenneth C. A. Smith, Cambridge, England, and Stephen J. Erasmus, Mountain View, Calif., assignors to National Research Development Corporation, London, England

Filed Jun. 16, 1983, Ser. No. 504,947

Claims priority, application United Kingdom, Jun. 18, 1982, 8217643

Int. Cl.⁴ H01J *3/12*

U.S. Cl. 250—397 **11 Claims**



1. A method of correcting astigmatism in an electron beam instrument which is provided with an objective lens coil and stigmator coils comprising carrying out the following sequence of steps, namely: measuring the magnitudes of each of all of the sample points of an entire image and calculating the variance of the said measured magnitudes, adjusting the focusing of the objective lens of the instrument to give an optimum value of variance, and then adjusting the stigmator coils in succession for optimum variance.

4,567,370

AUTHENTICATION DEVICE

James J. Falls, Salem, N.H., assignor to Baird Corporation, Bedford, Mass.

Filed Feb. 21, 1984, Ser. No. 581,582

Int. Cl.⁴ G01N *21/64*

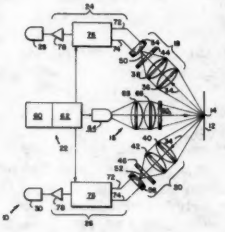
U.S. Cl. 250—461.1 **11 Claims**

1. An authentication device comprising:

(a) a sample treated with at least two luminophors each being ultra-violet energy excitable but emitting radiation at different spectral ranges;

(b) an excitation source to excite said treated sample;

(c) a pair of detectors for detecting said emitted radiation at said different spectral ranges; and



(d) a source of power coupled to said excitation source;

(e) said luminophors being each excitable by radiation at wavelength below 200 nanometers;

(f) one of said luminophors emitting in the visible range and the other of said luminophors emitting in the infrared range.

4,567,371

RADIATION IMAGE STORAGE PANEL

Akio Ishizuka, Fujinomiya; Hisashi Yamazaki, and Kikuo Yamazaki, both of Kaisei, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 30, 1984, Ser. No. 635,835

Claims priority, application Japan, Feb. 8, 1983, 58-141458

Int. Cl.⁴ G03C *5/16*

U.S. Cl. 250—483.1 **8 Claims**

1. A radiation image storage panel comprising a support, a subbing layer and a phosphor layer which comprises a binder and a stimulable phosphor dispersed therein, superposed in this order, characterized in that said subbing layer contains fine particles having a size of 1–30 μm in an amount of 1–200% by weight of a resin constituting the subbing layer.

4,567,372

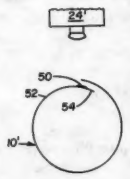
METHOD FOR CONTINUOUSLY MEASURING THE PERIMETER OF WRAPPED OBJECTS OF GENERALLY UNIFORM CROSS-SECTION

James W. Henry, Kingsport, and Robert C. Mumpower, Grey, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 409,754, Aug. 19, 1982, now Defensive Publication No.

Int. Cl.⁴ B31B *1/00*; A24C *1/00*

U.S. Cl. 250—560 **7 Claims**



1. Method of continuously determining the perimeter of an elongated object of generally uniform cross-section which comprises

forming on a flexible elongated sheet a single band of predetermined width and of contrasting color with respect to said sheet, said band being parallel to two opposite elon-

gated and parallel edges of said sheet, and wrapping said elongated object with said sheet so that one of said opposite elongated edges is overwrapped with respect to the other of said elongated edges and overlies and obscures a portion of the width of said single band, said single band being generally axially parallel to said elongated object;

placing detection means in position to detect the unobscured portion of said single band on said elongated object, said detection means having means for determining the width of the unobscured portion of the single band;

moving said object and said detection means relative to each other in a manner such that continuous detection of the width of said unobscured portion of said single band occurs, and

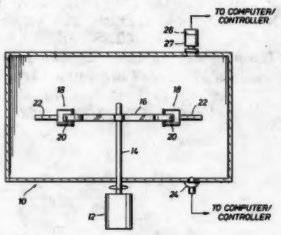
correlating the measured width to the perimeter of said elongated object.

4,567,373

CENTRIFUGAL ANALYZER

Joseph D. O'Meara, Jr.; Herbert H. Yuan; William O. Lease, and Robert G. Stapleton, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 20, 1982, Ser. No. 435,430
Int. Cl.⁴ G01H *15/06*
U.S. Cl. 250—573 **11 Claims**



6. Apparatus for detecting fluid interfaces in a sample, comprising:

a centrifuge having a predetermined number of sample holders and capable of variable speeds of operation;

a source of electromagnetic energy positioned to radiate onto at least one preselected holder as it passes by said source;

a photodiode array positioned to detect electromagnetic energy emanating from said at least one preselected holder;

synchronizing means for preselecting said at least one preselected holder to be irradiated by said source and whose electromagnetic energy is to be detected by said array;

recorder means for recording the signals from said array; and

controller means for controlling the speed of operation of said centrifuge, said synchronizing means, and said recorder means.

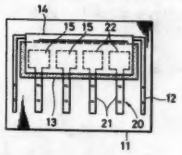
4,567,374

PHOTOELECTRIC CONVERTING DEVICE WITH A PLURALITY OF DIVIDED ELECTRODES

Mutsuo Takenouchi; Takashi Ozawa; Toshihisa Hamano; Hisao Itoh; Mario Fuse, and Takeshi Nakamura, all of Hongo Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 329,471, Dec. 10, 1981, Pat. No. 4,419,696. This application May 16, 1983, Ser. No. 494,666
Claims priority, application Japan, May 17, 1982, 57-82927
Int. Cl.⁴ H01L *27/14;* H04N *1/02*
U.S. Cl. 250—578 **5 Claims**

1. In a photoelectric converting device comprising an insulative base board, a plurality of divided electrodes, a photoelectric layer and a common electrode, said baseboard, divided electrodes, photoelectric layer and common electrode being placed one above another to form light beam receiving sections at overlapping areas between said divided electrodes and said common electrode, the improvement consisting in that the



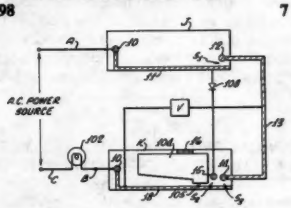
width of a photoelectric current lead-out portion extending from each of said light beam receiving sections of the divided electrodes is dimensioned less than the width of its respective divided electrode.

4,567,375

SOFT SWITCH WITH POSITIVE ON AND OFF STATES

Bruce D. Jimerson, 6415 Corsini Pl., Rancho Palos Verdes, Calif. 90274, and Henry H. Nakasone, 1672 Camrose Way, Anaheim, Calif. 92802

Filed Sep. 2, 1980, Ser. No. 182,996
Int. Cl.⁴ H01H *29/20, 35/02*
U.S. Cl. 307—98 **7 Claims**



1. A switching apparatus having an "on" state and an "off" state comprising:

actuating means for mechanically changing said switching apparatus from one state to another;

a first pair of contacts having a first electrode terminal and a second electrode terminal;

means for closing said first pair of contacts at the time said actuating means is operated to cause said switching apparatus to change from the "off" state to the "on" state;

a second pair of contacts having a first electrode terminal and a second electrode terminal;

means for delaying the closing of said second pair of contacts until after said first pair of contacts have closed;

a two terminal variable conduction angle network having a first terminal connected to the first electrode terminal of said first pair of contacts;

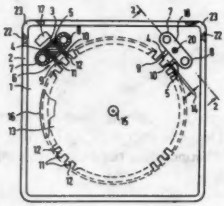
means for connecting first electrode terminal of said first pair of contacts to said first electrode terminal of said second pair of contacts;

means connecting said second terminal of said second pair of contacts to the second terminal of said two terminal variable conduction angle network.

4,567,376
SIGNAL GENERATOR

Manfred W. Zebisch, Georgensgmünd, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,669
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247446
Int. Cl.⁴ H03K 3/00
U.S. Cl. 307—106 5 Claims



1. An adjustable apparatus used in generating a signal indicative of the rotation of a shaft in a machine of the type having a rotatable ferromagnetic disk that includes a plurality of teeth on the peripheral rim, comprising:

(a) a U-shaped member including a permanent magnet having a pair of magnetizable plates positioned on opposite sides thereof and extending therefrom,

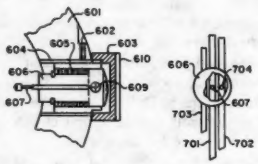
(b) a housing havng a wall parallel to said disk including a mounting bracket adapted to receive said U-shaped member, including two post-like brackets perpendicular to said wall for positioning said U-shaped member with said magnetizable plates extending toward said teeth on the rim of said disk, and a web that bridges said post-like brackets with a threaded hole in the center thereof, and

(c) clamping means for securing said member to said bracket when the plates thereof have been located at a desired distance from said teeth, said clamping means comprising a set screw passing through said threaded hole in said web.

4,567,377
MECHANICAL SWITCHING MEANS FOR PROVIDING SHUNT CALIBRATION IN A ROTARY TRANSFORMER SYSTEM

Kish Amlani, and Sherif Gindy, both of Troy, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 26, 1982, Ser. No. 444,839
Int. Cl.⁴ G01L 3/00; H01H 9/00
U.S. Cl. 307—112 11 Claims



5. A system for simultaneously calibrating and monitoring a signal output of a transducer mounted in a rotary member while the rotary member is rotating, comprising:

(a) support means which is maintained in a stationary position with respect to the rotary member,

(b) first, second, third and fourth stationary terminals mounted on the support means,

(c) first intermittent rotary contact means mounted on the rotary member for making intermittent connection between the first stationary terminal and a first calibration point on the transducer in conjunction with a calibrating impedance means,

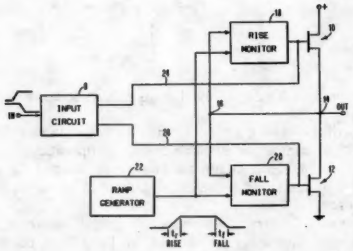
(d) second intermittent rotary contact means mounted on the rotary member for making intermittent connection between the second stationary terminal and a second calibration point on the transducer in conjunction with a calibrating impedance means, and

(e) switching means for switching the signal output of the transducer between the third and fourth stationary terminals, and switch driving means for driving the switching means from the third to the fourth stationary terminal only when intermittent contact is made to the first and second rotary contact means, the signal output for monitoring being supplied from the third stationary terminal and the single output for calibration being supplied from the fourth stationary terminal.

4,567,378
DRIVER CIRCUIT FOR CONTROLLING SIGNAL RISE AND FALL IN FIELD EFFECT TRANSISTOR PROCESSORS

Norman Raver, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1984, Ser. No. 620,235
Int. Cl.⁴ H03K 3/01, 17/687
U.S. Cl. 307—270 4 Claims



1. A driver circuit for providing an output signal having a rise time adjusted in accordance with a rise time of a standard ramp signal comprising:

an input circuit responsive to an input signal of the type having a rising level, said input circuit providing a corresponding rising signal on an output lead therefrom,

an output circuit including at least one output device having an output connection, said at least one output device being connected to said output lead of said input circuit and responsive to said corresponding rising signal of said input circuit,

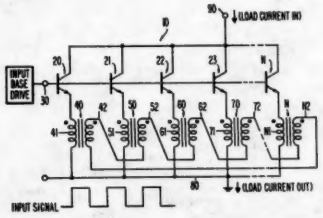
a ramp generator circuit connected to said output lead of said input circuit for providing an output signal having a desired rise time in response to said corresponding rising signal on said input circuit output lead,

a monitor circuit connected to said output connection of said at least one output device and to said ramp generator and responsive to said signals thereon to provide a feedback signal to said at least one output device when said output signal rises faster or slower than said ramp signal, said feedback signal adjusting said output signal in accordance with the rise time of said ramp signal.

4,567,379
PARALLEL CURRENT SHARING SYSTEM

Philip D. Corey, San Diego, Calif., and Elise T. Atkins, Deerfield Beach, Fla., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 23, 1984, Ser. No. 613,315
Int. Cl.⁴ H03K *3/01, 17/687*
U.S. Cl. 307—270 **2 Claims**



1. A current sharing electronic circuit comprising:

a plurality of active current flow devices including first, second and third devices, each having base, emitter and collector electrodes;

all of said collector electrodes being connected together, means connecting together all of the base electrodes of said devices, said means having a terminal;

a transformer for each active device including a first transformer for said first device, a second transformer for said second device, and a third transformer for said third device, each transformer having a primary winding and a secondary winding, and all of said primary windings being substantially identical and all of said secondary windings being substantially identical to provide identically-rated active current flow devices;

all of said secondary windings being connected in series to form a single current flow path with the current flow in each secondary winding being opposite in direction to current flow in the associated primary winding and the series serial connection being such that the dot end of each secondary winding is connected to the non-dotted end of the succeeding transformer secondary winding;

each emitter electrode being coupled through the primary winding of its transformer to a common reference bus; and

means for applying a wave of turn-on pulses between said terminal and said common bus, and thus to all of the base electrodes of said devices;

whereby when a turn-on pulse is applied to said devices and said devices turn on, current flows from the collector to the emitter of each of said devices and through the associated primary transformer winding, said current flow through the first device and the first transformer winding generating a secondary current in the path made up of all of said secondary transformer windings, said secondary current causing the primary currents in all of said primary windings to be substantially proportional to the current-carrying capabilities of the active current flow devices.

4,567,380
SCHMITT TRIGGER CIRCUIT

Yasushi Yasuda, Machida; Hiromu Enomoto; Yoshiki Shimauchi, both of Kawasaki, and Akinori Tahara, Zushi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 24, 1983, Ser. No. 507,496
Claims priority, application Japan, Jun. 29, 1982, 57-110611
Int. Cl.⁴ H03K *3/295*
U.S. Cl. 307—290 **6 Claims**

1. A Schmitt trigger circuit operatively connected to receive an input voltage and an input current and operatively connected to a power source and ground, comprising:

an input stage comprising:

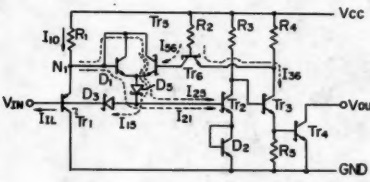
a first transistor having a base operatively connected to receive the input voltage, having a collector operatively connected to ground, and having an emitter operatively connected to the power source; and

a load resistor operatively connected between the emitter of said first transistor and the power source;

an output stage operatively connected to said input stage;

a second transistor operatively connected between said input stage and said output stage, having a base operatively connected to receive the input voltage, having an emitter operatively connected to ground, and having a collector operatively connected to the power source, said second transistor being turned on and off in dependence upon the input voltage, for controlling said output stage;

first circuit means including a first diode having a first terminal operatively connected to the emitter of said first transistor, and having a second terminal operatively connected to the base of said second transistor, the forward voltage drop of said first diode determining a threshold level of the input voltage to turn on said second transistor;



a third transistor, operatively connected in parallel with said first diode, having a collector operatively connected to the first terminal of said diode, having an emitter operatively connected to the second terminal of said diode, and having a base, for clamping the forward voltage of said first diode so as to determine a threshold level of the input voltage to turn off said second transistor;

second circuit means, operatively connected to said third transistor, for turning on said third transistor when said second transistor turns on;

third circuit means including a second diode having a cathode terminal operatively connected to the base of said first transistor and having an anode terminal operatively connected to the base of said second transistor, for discharing charges stored in the base of said second transistor; and

level shift means, operatively connected between the emitter of said third transistor and the anode terminal of said second diode, for preventing an abrupt increase in the input current when the input voltage decreases.

4,567,381
BIAS NETWORK HAVING ONE MODE FOR PRODUCING A REGULATED OUTPUT

Douglas S. Piasecki, Leonardo, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 1, 1983, Ser. No. 556,931
Int. Cl.⁴ H03K *17/16, 17/296, 17/60*
U.S. Cl. 307—296 R **10 Claims**

1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

an output node;

a transistor having a base, an emitter and a collector;

means connecting said collector to said output node and said emitter to one of said first and second power terminals;

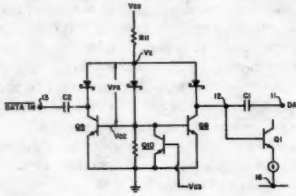
an intermediate node;

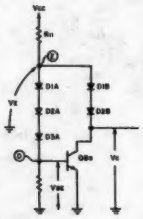
first and second diodes;

means connecting said first diode between said intermediate node and the base of said transistor, said first diode being

poled to conduct current in the same forward direction as the base-to-emitter of said transistor;

means connecting said second diode between said intermediate node and the collector of said transistor, said second diode being poled to conduct current in the same forward direction as the collector-to-emitter of said transistor; and





a current passing means coupled between the other one of said first and second power terminals and said intermediate node for supplying the base and collector currents of said transistor.

4,567,382

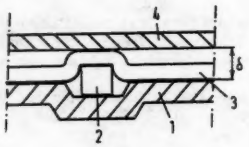
ELECTRET TRANSDUCER AND A METHOD FOR MANUFACTURING AN ASSEMBLY OF BACKPLATE, ELECTRET FOIL AND DIAPHRAGM PLATE

Aart Z. van Halteren, Zwaag, Netherlands, assignor to Microtel B.V., Amsterdam, Netherlands

Filed Apr. 10, 1984, Ser. No. 598,682

Int. Cl.⁴ C11C *13/02*

U.S. Cl. 307—400 **8 Claims**



5. An electret transducer comprising in combination: a casing and a motor assembly, said motor assembly comprising a diaphragm plate having a compliant surround at its periphery, a backplate, a plurality of apertures provided on said backplate, an electret foil disposed on said backplate, a plurality of substantially cylindrically shaped spacing disks, each being made of polyimide, and fixedly attached on said backplate respectively, said diaphragm plate through the intermediary of an electret foil portion being supported by said spacing disks.

4,567,383

FLUXOID TYPE SUPERCONDUCTING LOGIC ELEMENT

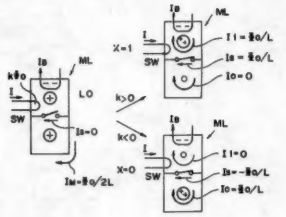
Eiichi Goto, and Hiroshi Ohta, both of Wako, Japan, assignors to Rikagaku Kenkyusho, Saitama, Japan

Filed Jan. 17, 1984, Ser. No. 571,464

Claims priority, application Japan, Jan. 20, 1983, 58-7975

Int. Cl.⁴ H03K *3/38, 19/195*

U.S. Cl. 307—415 **15 Claims**



1. A fluxoid type superconducting logic element characterized in that it comprises:

a base element including a single main superconductor loop ML and a switching element SW included in a superconductor extending across said main superconductor loop, thereby making it possible to magnetically separate said main superconductor loop into two subloops L1 and L0 when said switching element is closed;

means for applying a switch control signal to said switching element, thereby switching from the open position in which the critical current remains at a value small enough to repel any magnetic flux quantum unit from said main superconductor loop to the closed position in which the critical current is at a value large enough to sustain more than one magnetic flux quantum unit in said main superconductor loop;

means for applying a bias magnetic flux, the distribution of which tends to change in such a way that about a half of magnetic flux quantum unit ϕ_o may pass from one subloop to the other subloop when said switching element turns "off"; and

means for applying a relatively small amount of input magnetic flux to superpose itself on said bias magnetic flux,

whereby the distribution of an integer multiple (0, 1, −1) of magnetic flux quantum unit ϕ_o in said two subloops are varied by means of said input magnetic flux so as to represent a binary variable in terms of said distribution of an integer multiple of magnetic flux quantum unit.

4,567,384

VOLTAGE OFFSET PRODUCING CIRCUIT FOR USE WITH A LINE RECEIVER OR THE LIKE

Gary L. Stuhlmiller, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

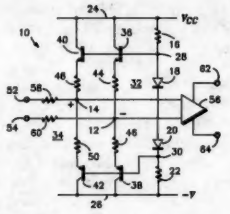
Filed Dec. 27, 1982, Ser. No. 453,387

Int. Cl.⁴ H03K *19/007, 19/092*

U.S. Cl. 307—442 **9 Claims**

1. Circuit for providing a voltage offset between first and second terminals, comprising first and second power supply conductors, bias circuit means coupled between said first and second power supply conductors and having first and second outputs at which first and second bias signals are provided respectively, first and second transistor circuit means each includes a first transistor and a second transistor of different conductivity type than said first transistor, said first and second transistors each having first, second and control electrodes, said control electrodes of said first and second transistors being coupled respectively to said first and second outputs of said bias circuit means, said first electrodes of said first and second transistors of said first transistor circuit means being coupled to

the first terminal, said first electrodes of said first and second transistor of said second transistor circuit means being coupled to the second terminal, said second electrodes of each of said



first transistors being coupled to said first power supply conductor, and said second electrodes of each of said second transistors being coupled to said second power supply conductor.

4,567,385

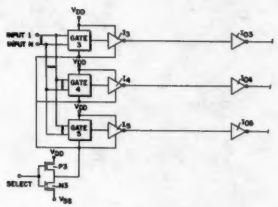
POWER SWITCHED LOGIC GATES

Scott L. Falater, and James D. Beasom, both of Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 22, 1983, Ser. No. 506,794

Int. Cl.[4] H03K *19/003, 19/094, 19/20*

U.S. Cl. 307—443 **25 Claims**



1. A selectable logic circuit comprising:

circuit input means for receiving data input signals;

first and second circuit power terminals;

a plurality of logic means connected in parallel to said circuit input means for producing output signals at its output as a logical function of said data input signals and having first and second logic power leads;

a plurality of buffer means each connected to the output of a respective logic means and having first and second buffer power leads;

said first logic power lead and said first buffer power lead being continuously connected to said first circuit power terminal; and

select means having a select input and being connected to said first and second circuit power terminals and to the second logic power leads and the second buffer power lead for connecting said second logic and buffer power leads to said second circuit power terminal in response to a select signal and to said first circuit power terminal in response to a deselect signal.

4,567,386

INTEGRATED LOGIC CIRCUIT INCORPORATING FAST SAMPLE CONTROL

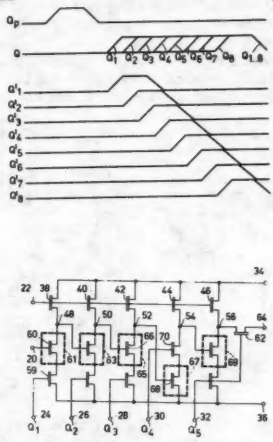
Nico F. Benschop, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,382

Claims priority, application Netherlands, Aug. 10, 1982, 8203148

Int. Cl.[4] H03K *19/096, 19/017, 19/20*

U.S. Cl. 307—481 **5 Claims**



1. A multiphase MOS integrated circuit comprising a plurality of groups of combinatory logic elements for forming in each group an associated AND/OR/INVERSION function, at least one data output terminal of each group being coupled to a data input terminal of at least one other group, the groups thereby being connected in a cascade of groups, said integrated circuit comprising clock means for generating multiphase clock pulse signals each having a leading edge with a finite rise time, at least one clock pulse per cycle controlling a sample operation, said circuit comprising a plurality of precharge transistors each having a control input for receiving a precharge control pulse in a first clock phase from said clock means for precharging a plurality of nodes, the circuit having a plurality of clock inputs for receiving from said clock means associated respective clock pulses during successive clock pulse phases as sample clock pulses for associated successive groups, so that within said cascade of groups a preceding group in the cascade is always sampled in an earlier phase than any successive group in the cascade, and said clock means having a plurality of delay means for generating said successive clock pulse phases at intervals with a lower bound that is substantially equal to the length of the leading edge of a sample clock pulse.

4,567,387

LINEAR SENSE AMPLIFIER

Ihor T. Wacyk, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 30, 1983, Ser. No. 509,787

Int. Cl.[4] H03K *5/153;* **G11C** *7/06, 11/40;* **H03F** *3/16*

U.S. Cl. 307—530 **12 Claims**

5. A sense amplifier comprising:

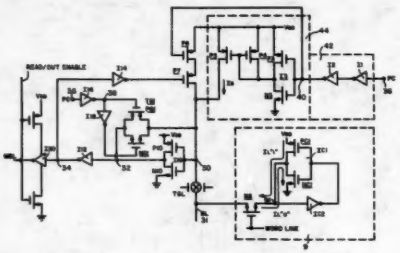
means for receiving recurrent precharge pulses;

an inverter having a signal input terminal, a signal output terminal, and first and second power terminals for receiving an operating potential therebetween, said inverter exhibiting a voltage transition point having a value be-

tween a first voltage level representing a first logic condition and a second voltage level representing a second logic condition, said output signal terminal of said inverter being driven toward one of said first and second voltage levels depending on whether a particular voltage being applied to its signal input terminal is above or below said voltage transition point;

selectively enabled feedback means responsive to each precharge pulse for completing a feedback connection from the output signal terminal of said inverter to its input signal terminal and placing said inverter at, or close to, said transition point during each precharge pulse occurence;

means including a selectively enabled gating transistor for selectively coupling signals to be sensed to the input signal terminal of said inverter, at selected times, each of which



times follows the inception of a precharge pulse and lasts for a period of time T_2 following the termination of each precharge pulse, the applied signals to be sensed having either one binary value characterized by a relatively large current I_1 of one polarity or the other binary value characterized by a relatively small current I_2 of opposite polarity to said one polarity; and

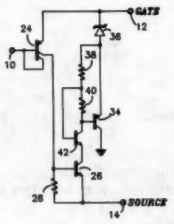
selectively enabled bias means responsive to each precharge pulse, said bias means being enabled after the inception of each precharge pulse for a period T_3 following the termination of each precharge pulse, said bias means including a current mirror for applying a bias current to the input of said inverter having a value intermediate said I1 and I2 and of same polarity as I2, and the amplitude of said bias current being set by a transistor of like conductivity type to said gating transistor for causing said bias current to vary in a similar manner as I1 and I2.

4,567,388

CLAMP CIRCUIT

Robert B. Jarrett, Tempe; W. Eric Main, Mesa, and Robert A. Neidorff, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1983, Ser. No. 538,241
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—540 **5 Claims**



1. A circuit for clamping the voltage across first and second terminals, between which said circuit is coupled, to a desired voltage in response to receipt of an input signal, comprising:

input means for generating a current in response to receipt of said input signal;

switching means coupled to said input means and to said first terminal for turning on when said current reaches a predetermined value and producing a first voltage drop thereacross;

buffer means coupled to said switching means and to a first source of supply voltage for turning on and providing a second voltage drop thereacross when said switching means turns on, said buffer means including

a PNP buffer transistor having a collector coupled to a first source of supply voltage, an emitter, and a base;

first and second series coupled resistors having a first end coupled to the base of said buffer transistor and having a second end; and

an additional NPN transistor having an emitter coupled to said switching means, a collector coupled to the base of said buffer transistor, and a base coupled to the junction of said first and second series coupled resistors; and

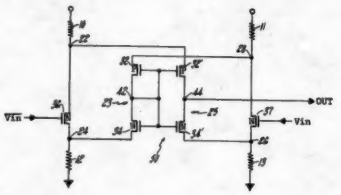
controlled voltage drop circuit means coupled between said second terminal, the emitter of said buffer transistor and said second end of said series coupled resistors for conducting current to produce a third voltage drop thereacross in series with said first and second voltage drop when said switching means and said buffer means are on, the emitter of said buffer transistor being coupled to said controlled voltage drop circuit means.

4,567,389

CMOS DIFFERENTIAL AMPLIFIER

Hiep Van Tran, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Jul. 5, 1984, Ser. No. 627,998
Int. Cl.[4] G11C *7/00*; H03F *3/45*
U.S. Cl. 307—530 **6 Claims**



1. A field-effect-transistor sense amplifier for responding to first and second input signals comprising:

a first side comprising a first upper transistor and a first lower transistor connected in series in a first current path between a supply voltage and ground, the drain of said first lower transistor being connected to the source of said first upper transistor at a gate node; and

a second side comprising a second upper transistor and a second lower transistor, connected in series in a second current path between said supply voltage and ground, the drain of said second lower transistor being connected to the source of said second upper transistor at an output node; characterized in that:

all of the gates of said first and second upper and lower transistors are connected to said gate node and said amplifier further includes;

first input means responsive to said first input signal for applying opposite-sense signals to the drain of said second upper transistor and the source of said first lower transistor; and

second input means responsive to said second input signal for applying opposite-sense signals to the drain of said first

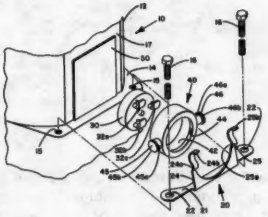
upper transistor and the source of said second lower transistor, whereby each of said first and second input means couples signals to both of said first and second sides.

4,567,390

INTERNAL LINE BREAK ASSEMBLY

Robert S. Stewart, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 2, 1984, Ser. No. 637,239
Int. Cl.⁴ H02K *11/00*; H01H *37/04*
U.S. Cl. 310—68 C **2 Claims**



1. An internal line break assembly for a hermetic compressor comprising:

a protector means for sensing the temperature of a motor winding and for cutting off electric power to the motor responsive thereto;

a protector mount means having a recess formed therein for receiving said protector means;

resiliently deformable bracket means coacting with said protector mount means having said protector means therein to bias said protector means into thermal contact with said motor winding; and

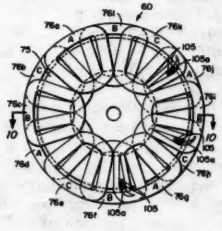
said protector mount means further having a pair of diametrically extending ears each including a cylindrical portion and a flange portion with said cylindrical portions coacting with said bracket means in the nature of a wedge to cause said protector means to be held in biased thermal contract with said motor winding.

4,567,391

PERMANENT MAGNET DISC ROTOR MACHINE

Hartwell F. Tucker, Los Altos; Jeffrey R. Tucker, Mountain View; Dennis Ross, San Leandro, and Jeffrey G. Knirck, San Jose, all of Calif., assignors to Octa, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 409,845, Aug. 20, 1982, Pat. No. 4,443,906. This application Apr. 23, 1984, Ser. No. 603,206
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.⁴ H02K *21/12*
U.S. Cl. 310—156 **13 Claims**



1. An electric motor comprising:

(a) a stator housing;

(b) armature winding supported by said stator housing, said armature winding having a annular configuration with an axis, said armature winding including an array of radially disposed coils with the axial extent of said coils less than the radial extent of said coils taken respectively;

(c) a rotor housing journalled for rotation about an axis coincident with the axis of said armature winding;

(d) an array of radially disposed permanent magnets supported by said rotor housing concentric therewith for concurrent movement, said permanent magnets having alternate magnetic fields in succession with the axial extent of said permanent magnets less than the radial extent of said permanent magnets taken respectively;

(e) a plurality of sensors in said stator housing disposed concentrically with said armature winding and responsive to the rotation of said rotor housing; and

(f) a switching circuit responsive to said sensors and connected to said armature winding to impart rotation to said rotor housing,

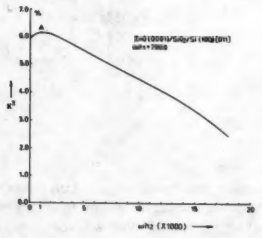
(g) said armature winding comprising juxtaposed layers of coils, each of said layers of coils comprising a plurality of coils wound in juxtaposed relation and disposed in a radial plane, the coils of one layer being arranged to interweave with the coils of another layer.

4,567,392

SEZAWA SURFACE-ACOUSTIC-WAVE DEVICE USING ZnO(0001)/SiO_2/ Si(100)(011)

Ryuichi Asai; Takeshi Okamoto, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,712
Claims priority, application Japan, Dec. 9, 1983, 58-232444; Dec. 9, 1983, 58-232445
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 310—313 A **20 Claims**



1. A surface acoustic wave device comprising:

a silicon substrate which is cut by a surface equivalent to the (100)-crystalline surface;

a silicon dioxide layer provided on said silicon sub- strate;

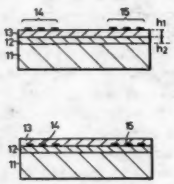
a zinc oxide layer provided on said silicon dioxide layer so that a surface thereof substantially equivalent to the (0001)-crystalline surface is parallel to said cut surface of said silicon substrate, said surface acoustic wave entered from said input electrode being propagated in a direction substantially equivalent to the [011]-axis of said silicon substrate up to said output electrode.

4,567,393

SURFACE ACOUSTIC WAVE DEVICE HAVING AlN AND ZnO LAYERS ON A Si SUBSTRATE

Ryuichi Asai; Takeshi Okamoto, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 618,971
Claims priority, application Japan, Jun. 14, 1983, 58-107436
Int. Cl.[4] H03H 9/25
U.S. Cl. 310—313 A 15 Claims



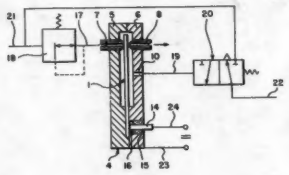
1. A surface acoustic wave device which comprises:
a silicon substrate having a major surface;
an aluminum nitride layer provided on said major surface of said silicon substrate;
a zinc oxide layer provided on said aluminum nitride layer; and
electrodes provided on said zinc oxide layer;
wherein said major surface of said silicon substrate has substantially (100)-, (110)-, (111)- or (112)-crystalline orientation.

4,567,394

ELECTRO-PNEUMATIC SIGNAL CONVERTER

Herbert Frisch, Vienna, Austria, assignor to ENFO Grundlagenforschungs AG, Dottingen, Switzerland

Filed Jan. 11, 1984, Ser. No. 569,958
Claims priority, application Austria, Jan. 13, 1983, A 101/83
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—330 9 Claims



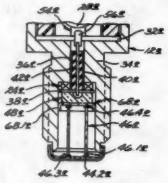
1. An electro-pneumatic signal converter, comprising a sealed casing having an air inlet thereto, an air outlet therefrom opposite said air inlet, both with a seating, and a signal output therefrom, a piezoelectric bending element which bends when an electrical voltage is applied to the signal converter, the bending element being securely clamped in a clamping area remote from said air inlet and outlet seatings to be centered in said casing and pressed against a contact surface thereof by a spring member controlling the air inlet seating and the air outlet seating to control the passage of air through the signal converter, the bending element being pretensioned against the air inlet seating and, in the absence of electrical voltage, bearing on the latter in a sealing manner, and when an electrical voltage is supplied to the signal converter, separating from the air inlet seating, bending towards the air outlet seating and closing the latter.

4,567,395

PIEZOELECTRIC PRESSURE TRANSMITTER FOR AN INTERNAL COMBUSTION ENGINE

Eshwarahalli S. Pundarika, Cambridge, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 26, 1984, Ser. No. 665,426
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—338 7 Claims



1. A device for providing an electrical signal corresponding to pressure in a cylinder of an internal combustion engine during normal running operation of the engine comprising
piezoelectric means for providing an electrical signal in response to application of presssure, and
means for mounting the piezoelectric means to be responsive to pressure in a cylinder of the engine, the mounting means including a body having a chamber opening at one end of the body accommodating the piezoelectric means therein, means for sealing said one body end in an engine well communicating with the cylinder, and diaphragm means secured over the chamber opening at said one body end to be movable in response to variations in fluid pressure in the engine cylinder to transfer forces to the piezoelectric means to provide an electrical signal corresponding to said cylinder pressure variation while shielding the piezoelectric means from an environment within the cylinder,
first rigid motion transfer means of a metal material having a portion of a cross section of relatively lesser area than said diaphragm, and
second rigid motion transfer means of a material of relatively lower thermal conductivity then said first motion transfer means,
the first and second motion transfer means being arranged in sequence between the metal diaphragm and the piezoelectric means to be freely movable with the diaphragm to transfer movements of the diaphragm to the piezoelectric means to provide said electrical signal while retarding the transfer of heat from the diaphragm through the motion transfer means to the piezoelectric means.

4,567,396

INCREASED EFFICACY HIGH PRESSURE SODIUM LAMP YIELDED BY INCREASED WALL TEMPERATURE OPERATION

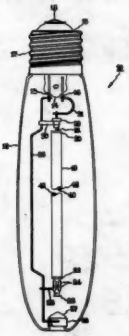
Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 444,777, Nov. 26, 1982, abandoned.
This application Dec. 17, 1984, Ser. No. 682,806
Int. Cl.[4] H01J 61/20, 61/34
U.S. Cl. 313—25 3 Claims

1. An improved high pressure metal vapor lamp having an outer vitreous envelope enclosing an inner arc tube having thermionic electrodes sealed in its ends and containing a charge of vaporable metal including the addition of a metal buffer gas such as mercury vapor with an operating pressure range of 0.1 to 5 atmospheres and having an emitting species of sodium at a typical operating pressure of 60 Torr, an inert starting gas such as xenon having a cold filling pressure in the range of 7 to 350 Torr, and an operating wall temperature in

the range of 1000° C. to 1400° C., said inner arc tube comprising:

an optically translucent polycrystalline aluminum oxide ceramic formed of a composition of MgO and having an additive selected from the group consisting of ZrO_2, HfO_2 and mixtures thereof, and;



said inner arc tube in cooperation with the given buffer gas, sodium, and inert gas pressures as well as the wall temperature range being effective to reduce the typically expected operational sodium losses while increasing the efficacy of said high pressure metal vapor lamp.

4,567,397

ELECTRIC LAMP HAVING A LIGHT SOURCE ALIGNED TO A CAP

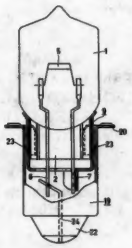
Dieter Wilhelm, Eschweiler; Werner Schlagheck, Aachen-Laurensberg, and René Toussaint, Herzogenrath, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 25, 1983, Ser. No. 497,986

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221290

Int. Cl.⁴ H01J *5/48, 5/58, 5/60*

U.S. Cl. 313—318 **21 Claims**



1. An electric lamp comprising a generally circular-cross-section tubular cap formed mainly of metal and defining an axis; a lamp envelope having a pinch, an electric light source arranged in the envelope, and source current conductors extending through the pinch to the envelope exterior and electrically connected to the cap; and a metal sleeve having an outer surface and secured in the cap, the pinch being received with a clamping fit in the sleeve,

characterized in that the cap has at least three inwardly directed depressions which lie generally in a plane perpendicular to the cap axis and are distributed around the cap circumference with each depression forming a point of contact with the outer surface of the sleeve,

aside from the depressions, the inner diameter of the cap is larger than the outer surface of the sleeve over the whole length of the cap opposite the sleeve such that prior to securement of said sleeve to said cap the lamp envelope together with said sleeve can not only be longitudinally displaced and rotated with respect to the cap but can also be pivoted with the depressions serving as points of rotation so that the light source can be aligned in three dimensions with respect to the cap,

said at least three depressions being secured to said sleeve to maintain the alignment.

4,567,398

LIQUID METAL ION SOURCE

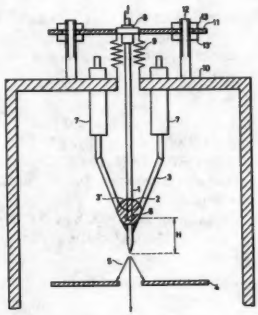
Tohru Ishitani, Sayama; Hifumi Tamura, Hachioji, and Akira Shimase, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,473

Claims priority, application Japan, Apr. 14, 1982, 57-61063

Int. Cl.⁴ H05H *1/00;* **H01J** *1/02*

U.S. Cl. 313—362.1 **2 Claims**



1. A liquid metal ion source comprising an electrode with a fore end formed in the shape of a needle, a reservoir for holding a source material to be ionized in a molten state, an extractor for applying a high electric field to the fore end of the needle electrode wetted with the molten source to extract ions of said source material from said fore end of said needle electrode, a vacuum chamber enveloping said reservoir, said extractor and at least the fore end of said electrode, and means for finely adjusting a distance between said reservoir and said fore end of said needle electrode from outside said vacuum chamber whereby the amount of the source material supplied from said reservoir to the fore end of said electrode can be balanced with the amount of the source material ionized from the fore end of said electrode.

4,567,399

CATHODE RAY TUBE WITH SPHERICAL ABERRATION CORRECTION MEANS

Aart A. van Gorkum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,231

Claims priority, application Netherlands, Feb. 22, 1982, 8200691

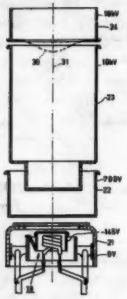
Int. Cl.⁴ H01J *29/56*

U.S. Cl. 313—449 **9 Claims**

1. In a cathode ray tube comprising an evacuated envelope containing a target and an electron gun for producing an electron beam directed along a longitudinal axis of the gun and for focusing said electron beam onto said target, said electron gun including, in the direction of propagation of the electron beam, first and second adjacent electrodes disposed coaxially around said axis for producing an accelerating electron lens,

the improvement comprising means for effecting a prede-

fined correction of spherical aberration of said lens, said means including a conductive, electron penetrable member extending across and electrically-connected to an end



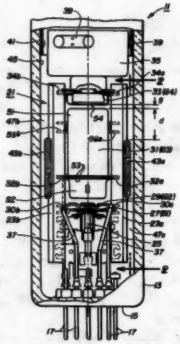
of the second electrode which is nearby the first electrode, said member being curved toward said first electrode, the curvature of said member initially decreasing with distance from said axis.

4,567,400

CRT COMPRISING METALLIZED GLASS BEADS FOR SUPPRESSING ARCING THEREIN

Stephen T. Opresko, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1983, Ser. No. 470,561
Int. Cl.⁴ H01J *29/82*
U.S. Cl. 313—457 **7 Claims**



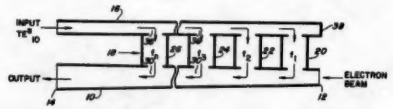
1. In a cathode-ray tube comprising a glass neck and an electron-gun mount assembly in said neck, said mount assembly comprising an electron beam source and a plurality of successively spaced-apart electrodes including an end electrode, means for applying an anode voltage to said end electrode, an adjacent focus electrode, means for applying a focus voltage to said focus electrode, said end electrode and said focus electrode defining a gap of predetermined width, at least two glass beads peripheral to said electrodes for supporting said electrodes at predetermined spacings, said focus electrode comprising outwardly-extending claws embedded in said beads, and an electrically-conductive coating on the outwardly-facing surface of each of said beads, the improvement wherein said coatings are located opposite said focus electrode and are at least four times said gap width away from positions on said outwardly-facing surfaces that are opposite said gap between said end electrode and said focus electrode, and said claws of the focus electrode are not opposite coated portions of said beads that are located up to half the distance between the ends of said focus electrode away from said gap.

4,567,401

WIDE-BAND DISTRIBUTED RF COUPLER

Larry R. Barnett, Manassas, Va.; Yue-Ying Lau, Silver Spring, Md.; Kwo R. Chu, Annandale, Va., and Victor L. Granatstein, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 12, 1982, Ser. No. 389,132
Int. Cl.⁴ H01J *25/38, 25/34*
U.S. Cl. 315—5 **13 Claims**



1. An rf traveling-wave amplifier including:

a tapered interaction waveguide wherein the cross-section thereof gradually increases from a small first end thereof to a larger second end for propagating electromagnetic energy in a broad frequency band therein;

an input waveguide disposed external to said interaction waveguide for providing electromagnetic waves to be amplified;

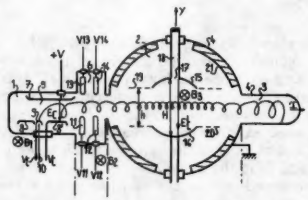
a multiplexer distributed coupler circuit disposed external to said interaction waveguide for coupling electromagnetic energy from said input waveguide to said interaction waveguide comprising a plurality of channel frequency filters disposed outside said interaction waveguide, with each filter tuned to a different frequency passband, with each filter coupled to said interaction waveguide at a different appropriate cross-sectional position along the tapered length thereof such that the interaction waveguide cutoff frequency at that position approximately matches the wave frequency propagated by said filter so that electromagnetic energy propagated by the given filter will excite the desired mode of electromagnetic energy to propagate toward said larger second end of said interaction waveguide.

4,567,402

ELECTRON BEAM INJECTION DEVICE FOR AN ULTRA-HIGH FREQUENCY RADIO ELECTRIC WAVE GENERATOR

Georges Mourier, Le Port Marly, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 2, 1984, Ser. No. 595,663
Claims priority, application France, Apr. 6, 1983, 83 05604
Int. Cl.⁴ H01J *25/34*
U.S. Cl. 315—39.3 **3 Claims**



1. A device for injecting into an interaction zone an electron beam propagating along an axis (x) in a helical path under the

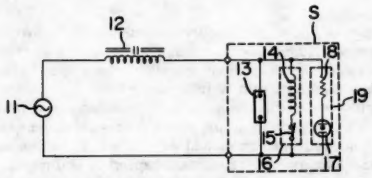
action of a continuous electric field and a static magnetic field (B) perpendicular to the axis of a propagation and to the electric field, comprising an electron gun placed in a weak magnetic field and means, placed in a magnetic field (B_2) increasing progressively along the axis of propagation of the beam, for creating in this zone a continuous electric field having two components (E_X, E_Y) in the plane perpendicular to the magnetic field to compensate the movement perpendicular to the axis due to the increasing of the magnetic field, said means being located between the gun and the interaction zone.

4,567,403

HIGH PRESSURE DISCHARGE LAMP WITH INCORPORATED STARTER

Yoshio Ohtagaki, Gyoda; Masafumi Ochi, Kounosu; Motonobu Masui, Kumagaya; Kanichi Tachibana, Saitama, and Akio Uchida, Yokose, all of Japan, assignors to Iwasaki Electric Co., Ltd. and Mitsubishi Mining & Cement Company, Ltd., both of Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,969
Int. Cl.[4] H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—47 **10 Claims**



1. A discharge lamp device comprising a discharge lamp, an inductive stabilier connected in series with discharge lamp, starting circuit means, including a resistor and a bimetal switch in series connected to said discharge lamp for providing a starting voltage waveform including repetitive high voltage pulses, and

pulse wave conversion means having a micro-gap element comprising an insulating member of high relative dielectric constant, a conductive layer divided into separate zone formed on said insulating member and electrodes respectively connected to separate ones of said zones, and air-tight container enclosing the micro-gap element and filled with a rare or inert gas, and a resistor connected in series with the micro-gap element, the micro-gap element being constructed to be rendered conductive at a voltage lower than the starting voltage of the discharge lamp but higher than the secondary load-free voltage of the stabilizer, and the resistor having a value such that said pulse waveform conversion means converts said starting voltage waveform from an oscillatory waveform to a damped waveform having wider half value width.

4,567,404

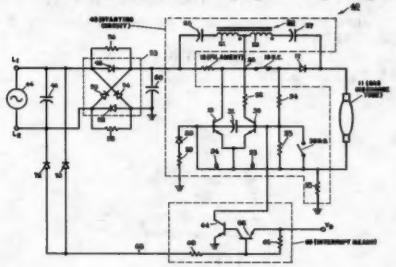
BALLAST CIRCUIT HAVING ELECTROMAGNETIC INTERFERENCE (EMI) REDUCING MEANS FOR AN IMPROVED LIGHTING UNIT

David Flugan, Hudson, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,919
Int. Cl.[4] H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—205 **6 Claims**

1. In a lighting unit having a gas discharge tube as the main light source, a filament serving as a supplementary light source and as a resistive ballast element, and a ballast circuit comprising means for coupling conduction inducing triggering pulses to said gas discharge tube, said ballast circuit being adapted to accept across its first and second input terminals an applied alternating current (A.C.) voltage, said first and second input terminals having connected thereacross rectifying means comprising four diodes arranged in a full-wave configuration and having at its output stage a filter capacitor, the improvement comprising:

control means effective for developing an output signal



indicative that at least one of said diodes of said rectifying means is in a forward-biased condition, and;

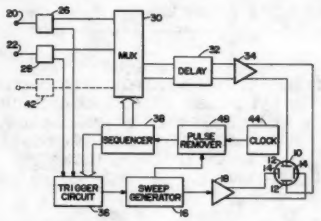
interrupt means responsive to said output signal of said control means and effective for generating a disabling signal to inhibit the coupling of said conduction inducing triggering pulses to said gas discharge tube.

4,567,405

OSCILLOGRAPHIC DEVICE FOR DISPLAYING MULTIPLE CONTINUOUS WAVEFORMS

Lloyd R. Bristol, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 28, 1983, Ser. No. 555,785
Int. Cl.[4] G01R *13/28*
U.S. Cl. 315—392 **12 Claims**



1. An oscillographic device for providing a display of repetitive waveform phenomena, said device comprising:

first beam deflection means for deflecting an electron beam in a first sense to portray amplitude input signal information and orthogonal deflection means for concurrently deflecting said beam in a second sense for representing time,

time base means for providing a sweep signal to said orthogonal deflection means,

and switching means for receiving plural input signals and consecutively and repetitively employing said plural input signals for operating said first deflection means, said switching means having a switching rate sufficiently rapid to provide the effect of substantially simultaneous display of the plural input waveforms,

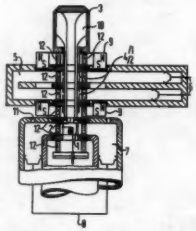
including means for automatically varying switching times of said switching means during display of said waveforms to avoid gaps in waveform presentation when the period of said sweep signal is near a multiple of the switching period of said switching means.

4,567,406

HIGH-GAIN KLYSTRON-TETRODE

Hinrich Heynisch, Gräfelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,788
Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317788
Int. Cl.[4] H01J 23/08
U.S. Cl. 315—5.33 2 Claims



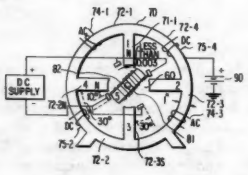
1. High-gain klystron-tetrode, comprising a tube for accomodating a hollow beam; a ring cathode with a heater, two resonator gap apertures and a collector for generating the hollow beam; a ring grid for current-modulating the hollow beam; an external cavity resonator for current modulation, said external cavity resonator having a tuning slider of a grid-cathode circuit for operating the klystron-tetrode; and a re-entrant output cavity resonator, said reentrant cavity resonator having two independent tuning sliders for generating HF power by setting the resonator frequency and optimizing the phase between said resonator gap apertures for inphase and substantially in-phase operation, and said re-entrant cavity resonator having magnets integrated therein for focussing the hollow beam.

4,567,407

BIASED UNITIZED MOTOR ALTERNATOR WITH STATIONARY ARMATURE AND FIELD

John W. Ecklin, 6143K Edsall Rd., Alexandria, Va. 22304

Filed Jun. 25, 1982, Ser. No. 392,102
Int. Cl.[4] H02P 7/66; H02K 47/04
U.S. Cl. 318—140 8 Claims



1. A unitized motor alternator for generating alternating current energy comprising in combination,

a flux switch alternator having an stator with a plurality of pole pieces therein, AC output windings on said stator, a rotor having a high magnetic permeability and low magnetic retentivity,

motor winding means on said stator,

means for energizing said motor winding means to apply a conservative force to said rotor of said flux switch alternator and simultaneously induce AC voltage in said AC output windings and,

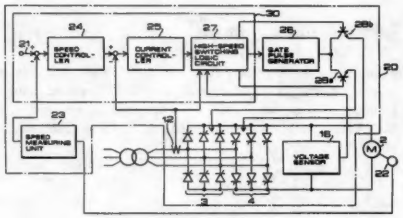
means for coupling a load to said AC output windings.

4,567,408

DIGITALLY CONTROLLED RECTIFYING SYSTEM FOR DRIVING A MOTOR

Masamichi Mitsuhashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 616,475, Jun. 1, 1984, abandoned. This application Dec. 28, 1984, Ser. No. 687,025
Claims priority, application Japan, Jun. 3, 1983, 58-99676
Int. Cl.[4] H02P 5/16
U.S. Cl. 318—317 3 Claims



1. A digitally controlled rectifying system used for driving a direct current (d.c.) motor through a forward and reverse converters connected in an anti-parallel fashion so as to block a circulation current, said system comprising:

(a) a pulse generator coupled to the drive shaft of said motor;

(b) a speed measuring means which counts pulses generated by said pulse generator and produces a digital value in correspondence to the rotational speed of said motor;

(c) a speed controller which receives a speed command signal and the output of said speed measuring means;

(d) a current controller which receives the output of said speed controller and the output of a current transformer coupled to an alternating current (a.c.) input power line to said converters;

(e) logic means which receives the output of said current transformer and the output of a voltage sensor connected to detect the output voltage of said converters, said logic means operating on the firing phase angle of said converters to shift by 180° at a time of gate switching operation so that the load current is forced to become zero, said logic means operating on the firing phase angle of said converters to shift following the gate switching operation so that the load current is substantially zero; and switch means operated by said logic means to supply gate pulses to one of said forward and reverse converters.

4,567,409

CONTROL CIRCUIT FOR MOTOR

Masahiko Ogawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,102
Claims priority, application Japan, Jun. 16, 1983, 58-108488
Int. Cl.[4] G05B 5/00
U.S. Cl. 318—327 2 Claims

1. A circuit arrangement for controlling a motor having a rotor and a winding for driving the rotor in response to a supplied electrical current, comprising:

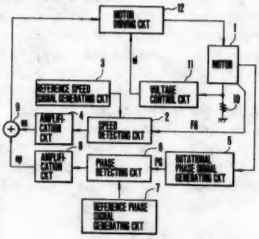
(A) a first reference signal generating circuit for generating a first reference signal indicative of a predetermined rotational speed to which the rotational speed of said rotor is to be adjusted;

(B) a second reference signal generating circuit for generating a second reference signal indicative of a predetermined rotational phase to which the rotational phase of said rotor is to be adjusted;

(C) a first detection circuit for detecting deviation of the rotational speed of said rotor from said predetermined speed and for producing a first control signal corresponding to said speed deviation;

(D) a second detection circuit for detecting deviation of the rotational phase of said rotor from said predetermined phase and for producing a second control signal corresponding to said phase deviation;

(E) a third detection circuit for detecting the level of the electrical current flowing through said winding and for producing a third control signal corresponding to said current level; and



(F) a control circuit responsive to said first, second and third control signals for controlling the electrical current and voltage to be supplied to said winding;

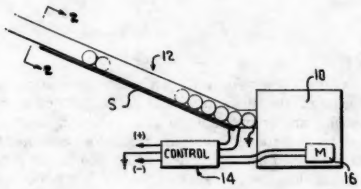
said control circuit being arranged to increase the level of the voltage to be applied to said winding when an increase in the level of the electrical current flowing through the winding is indicated by said third control signal.

4,567,410

CAPACITIVE ARTICLE DENSITY MONITOR

Ralph E. Martin, Oak Lawn, and Heino Puidak, Hoffman Estates, both of Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Dec. 3, 1984, Ser. No. 677,411
Int. Cl.[4] H02P *5/00*; B65G *43/00*
U.S. Cl. 318—332 **22 Claims**



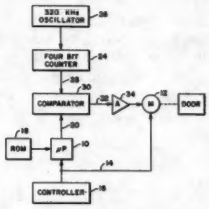
1. A capacitive article density monitor comprising an elongated sensor, a compensator in the form of a bank of capacitors including a plurality of individual capacitors each having a selector switch, a power supply, a pulsed control unit providing control pulses at different intervals, a first selector gate unit controlled by selected ones of said control pulses to sequentially connect said power supply to said sensor and to said compensator, a second selector gate unit for selecting between the outputs of said sensor and the output of said compensator, and an integrator for receiving the selected outputs of said second selector gate unit for providing a voltage output in accordance with the article density sensed by said sensor.

4,567,411

HIGH FREQUENCY PULSE WIDTH MODULATION

Kurt Reimann; Bernd Ackermann; Rüediger Löeb, all of Berlin, and Claus Ruther, Munich, all of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 22, 1985, Ser. No. 715,130
Int. Cl.[4] H02P *3/00*; B66B *1/30*
U.S. Cl. 318—341 **1 Claim**



1. A high frequency pulse width modulation circuit for controlling a door drive motor atop an elevator car in response to a low frequency microprocessor, comprising:

a controller (16) for providing a state signal indicative of "door open" or "door close";

ROM means (18) for storing a velocity signal indicative of the desired velocity profile of the door drive motor;

a microprocessor (10) having a slow duty cycle, responsive to the state signal for providing the velocity signal from the ROM to a first line (20);

high frequency oscillator means (26) for providing a high frequency signal;

counter means (24) for providing an incrementing count signal on a second line (28) several times during the duty cycle of the microprocessor in response to the high frequency signal;

comparator means (30), connected at its inputs to the first line (20) and to the second line (28), for providing an output signal on a third line (32) which is High when the velocity signal is greater than the incrementing count signal and which is Low when the incrementing count signal is greater than or equal to the velocity signal, so that the High:Low ratio of the output signal is proportional to the velocity signal from the microprocessor;

amplification means (34), connected at its input to the third line (32) for providing an output at power levels for operating the door drive motor (12) in response to the comparator means output, wherein the door drive motor speed is proportional to the High:Low ratio of the output signal.

4,567,412

AUTOMATIC WIPER ACTUATOR FOR A VEHICLE WINDOW

Donald E. Graham, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1984, Ser. No. 676,385
Int. Cl.[4] H02P *1/04*
U.S. Cl. 318—483 **1 Claim**

1. A control system for a motor driven wiper on a vehicle window comprising, in combination:

an oscillator effective to generate a rectangular voltage wave of supply and ground voltage levels having a substantially constant frequency and duty cycle;

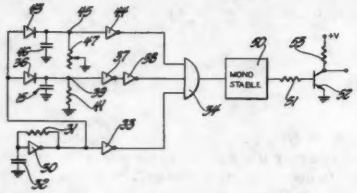
an AND gate with three inputs and an output;

an inverter effective to invert the rectangular voltage wave and apply the inverted rectangular voltage wave to the first AND gate input;

first wave transformation means comprising a series diode and inverter with a first capacitor and first resistor connected from the junction of the diode and inverter to ground, the resistance of the first resistor being variably

controllable by an operator of the vehicle, the first wave transformation means being connected from the oscillator to the second AND gate input, whereby it applies to said input the rectangular voltage inverted and delayed by a first time period;

second wave transformation means comprising a diode followed by two series inverters with a parallel second capacitor and second resistor connected from the junction of the diode and one of the series inverters to ground, the second wave transformation means being connected from the oscillator to the third AND gate input, the second capacitor being located adjacent the lower edge of the wiped portion of the vehicle window and responsive in capacitance to the presence of moisture on said wiped



portion, whereby the second wave transfomation means applies to the third AND gate input the rectangular wave delayed by a second time period varying with said capacitance and thus with the moisture on the window;

a retriggerable monostable multivibrator connected to the output of the AND gate and effective, when triggered by common supply voltage levels on all three inputs, to generate an energized output of period longer than a cycle of the rectangular voltage wave; and

means responsive to the energized output of the retriggerable monostable multivibrator to activate the motor driven wiper to perform a wipe cycle, whereby the wiper system is automatically activated in response to moisture on the windshield and is further adjustable by the vehicle operator in sensitivity to moisture.

4,567,413

METHOD AND DEVICE FOR CONTROLLING POWER STEERING APPARATUS

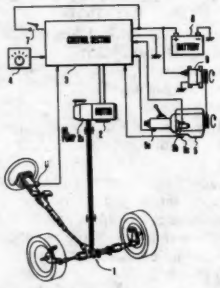
Hideo Yabe, Hiki, and Ichiro Koike, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,873

Claims priority, application Japan, Jun. 28, 1983, 58-116635

Int. Cl.⁴ H02P 7/29

U.S. Cl. 318—489 **6 Claims**



1. A device for controlling a power steering apparatus having an oil pump driven by a motor, said device comprising:

first detecting means for detecting that the motor is imposed with a high load;

second detecting means for detecting that the motor is imposed with an overload;

an alarm unit for generating an alarm in response to an output from said first detecting means; and

controlling means for inhibiting supply of current to the motor for a predetermined period of time upon reception of an output from said second detecting means and for enabling supply of current to the motor after said predetermined period of time has elapsed, said controlling means including a timer for generating an output when a time interval has elapsed after said second detecting means generates an output, an integrator for integrating the output from said second detecting means, an AND gate for receiving outputs from said timer and said integrator, and means for opening a switch inserted between the motor and a power supply for the predetermined period of time in response to an output from said AND gate.

4,567,414

METHOD AND A DEVICE FOR CONTROLLING A BRUSH-COMMUTATOR ASSEMBLY OF AN ELECTRIC MACHINE

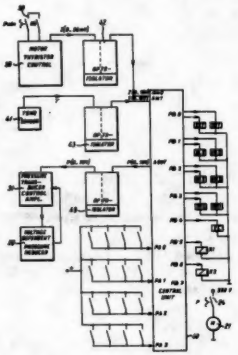
Josephus B. M. Berings, Padlaan 11, 1561 Za Krommenie, Netherlands

Filed Jul. 11, 1983, Ser. No. 512,894

Claims priority, application Netherlands, Jul. 12, 1982, 8202816

Int. Cl.⁴ H01R 39/42

U.S. Cl. 318—542 **17 Claims**



1. A method for controlling a brush-commutator assembly of a commutator machine under application of an electrical processing and control unit, by sensing one or more operating parameters of the commutator machine; the sensing values being processed and converted into one or more control signals controlling the operation of the brush-commutator assembly to provide an optimal commutation process of the machine current, said brush-commutator assembly including two more brush tracks for the brushes, whereby the machine current is sensed and the pressure exerted on the brushes is continuously regulated by a fluid under pressure, the brush tracks being engaged and disengaged to redistribute the machine current—upon an increase and decrease of the machine current respectively—for maintaining an optimal current density in the brushes and to change over the brush tracks in a cyclical and preferential manner to provide equal brush wear.

5. A device for controlling a brush-commutator assembly of a commutator machine, comprising one or more sensors, including a machine current sensor, for sensing operating parameters of the commutator machine, an electrical processing and control unit to process the signals sensed by the sensors and to

supply control signals to one or more control means controlling the operation of the brush-commutator assembly for an optimal commutation process of the machine current, said brush-commutator assembly comprising sets of brush holders, divided into two or more brush tracks, whereby said device includes a fluid control circuit provided with an electrically controllable pressure system and a plurality, at least corresponding to the number of the brush tracks, of solonoid valves capable of continuously regulating the pressure exerted on the brushes in the brush holders and the engagement and disengagement of the brush tracks, to redistribute the machine current and to change over the brush tracks, by means of the fluid under pressure under the control of the electrical processing and control unit.

4,567,415

SYSTEM FOR CONTROLLING THE MOVEMENT OF AN INDUSTRIAL MANIPULATOR

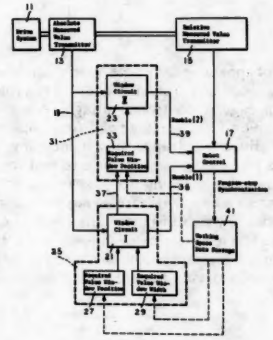
Karl-Heinz Friederichs, Kiel, and Joachim Schlapkohl, Klausdorf, both of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,177

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1983, 3312939

Int. Cl.[4] G05B *23/02*

U.S. Cl. 318—565 11 Claims



1. A movement control system for use with an industrial manipulator having drive means for movement in at least one degree of freedom comprising:

an absolute value transmitter means operably associated with said industrial manipulator, said absolute value transmitter generating a first output signal reflective of the movement in at least one degree of freedom;

a relative value transmitter means operably associated with said industrial manipulator, said relative value transmitter generating a second output signal reflective of several reference marks within said at least one degree of freedom;

a first window circuit defining a first predetermined positional range and a second window circuit defining a second predetermined positional range which second range lies within the first range, responsive to said first output signal, said window circuits transmitting releasing signals which permit actuation of the drive means when the position of the industrial manipulator is within said predetermined positional range.

4,567,416

DEVICE FOR CONTROLLING AN ELECTRIC MOTOR

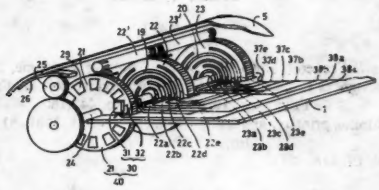
Charles Brunier-Coulin, Sallanches, France, assignor to Somfy, France

Filed Apr. 15, 1983, Ser. No. 485,230

Claims priority, application France, Apr. 23, 1982, 82 07020

Int. Cl.[4] G05B *19/29*

U.S. Cl. 318—602 2 Claims



1. A device for controlling an electric motor adapted for rotating a drive shaft of a movable member, the device comprising:

a hybrid encoder, including means for generating a pulse output signal in response to the rotation of the drive shaft, and a shaft position encoder;

the pulse signal generating means including a rotatable apertured disc operatively linked to the drive shaft to rotate therewith, the apertured disc including a plurality of apertures arranged circumferentially thereabout, the apertures being formed through the thickness of the disc, the apertured disc having opposite flat sides; and an optoelectronic emitter and receiver arranged on opposite flat sides of the apertured disc and in alignment with the apertures, the emitter being adapted to emit a light beam through the apertures and the receiver being adapted to receive the light beam, the apertured disc being interposed between the emitter and the receiver to periodically interrupt the light beam upon rotation of the apertured disc,

the shaft position encoder including at least two rotatable encoder discs arranged coaxially with the apertured disc, the apertured disc and each of the at least two encoder discs being mechanically linked to proportionally rotate at different speeds so that a complete revolution of the apertured disc will result in a partial revolution of one of the at least two encoder discs, and a complete revolution of said one of the at least two encoder discs will result in a partial revolution of the other of the at least two encoder discs;

each of the at least two encoder discs including at least one electrically conductive continuous emitting track mounted thereon and at least one electrically conductive discontinuous receiving track mounted thereon; and electrically conductive contacts positioned adjacent to and in contact with each of the emitting and receiving tracks of each encoder disc, the shaft encoder providing an output signal representative of the angular position of the drive shaft;

means for regulating a desired angular stopping position, the stopping position regulating means including switching means, the switching means providing an output signal;

means for controlling the rotation of the motor, the motor controlling means including switching means, the switching means of the motor controlling means providing an output signal;

a logic processing unit responsive to the output signals of the pulse signal generating means and the shaft encoder of the hybrid encoder and to the output signals of the switching means of the regulating means and the motor controlling means, the logic processing unit providing a control signal to the electric motor, the logic processing unit including a working memory for storing a desired angular stopping position, the logic processing unit being provided for analyzing the output signal of the pulse signal generating

means, for calculating the angular position of the drive shaft, for comparing the angular position of the drive shaft with the desired stopping position, and for interrupting the rotation of the motor when the angular position of the drive shaft is equal to the desired stopping position; and

an erasable and non-volatile memory for protectively storing the desired angular stopping position in the event of a power failure, the non-volatile memory being connected to the logic processing unit.

4,567,417

ACTUATOR

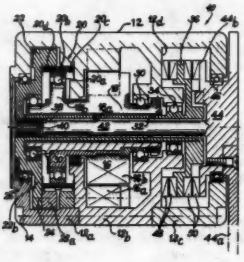
Daniél Francois, and Gilles Mercey, both of Vendome, France, assignors to La Calhene, Societe Anonyme, Bezons, France

Filed Nov. 16, 1982, Ser. No. 442,160

Claims priority, application France, Nov. 24, 1981, 81 21968

Int. Cl.⁴ G05B *11/01*

U.S. Cl. 318—632 **9 Claims**



1. An actuator, comprising a box or case, an electric motor having a stator fixed within the said box or case, a speed reducing gear located in the box or case and having a leading part driven by the rotor of the electric motor, an actuating part outside the box or case and connected to a led part of the reducing gear by angularly flexible mechanical connection means, first means for detecting a first angular displacement between the actuating part and the led part, and second means for detecting a second angular displacement between the led part and the box or case.

4,567,418

OPERATION CONTROL APPARATUS FOR ROBOTS

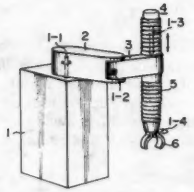
Akinobu Takemoto; Kenzo Takeichi, both of Tochigi; Yuhiko Yabe, Kasukabe, and Yoshiaki Yoshikawa, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,884

Claims priority, application Japan, Aug. 29, 1983, 58-156242

Int. Cl.⁴ G05B *19/40*

U.S. Cl. 318—685 **5 Claims**



1. A robot operation control apparatus having control signal generating means and driver means for driving arms of a robot in a predetermined point-to-point movement in response to a control signal of said control signal generating means, wherein each robot arm is provided with a stepping motor and said driver means, said arm being driven by said stepping motor, said stepping motor being excited by said driver means, said control signal generating means being associated with each said driver means,

said control signal generating means being provided for controlling each said driver means so that said driver means excites said stepping motor in 1–2-phase excitation mode at a predetermined low-speed range and in 2-phase excitation mode at a predetermined intermediate and high speed ranges, wherein a change from the 1–2-phase excitation mode to the 2-phase excitation mode occurs when two phases of said stepping motor are excited at a same time.

4,567,419

CONTROL APPARATUS FOR ELEVATOR

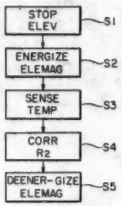
Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,655

Claims priority, application Japan, Jul. 6, 1983, 58-122614

Int. Cl.⁴ H02P *5/40*; B66B *1/30*

U.S. Cl. 318—798 **15 Claims**



1. A control apparatus for an elevator wherein an induction motor having secondary windings included in a rotary member for driving a cage is controlled using a power conversion device operative to vary voltage and frequencies supplied to said motor, said control apparatus comprising temperature sensor means for sensing temperatures of said rotary member of said induction motor during stoppage of said rotary member to stop the cage, and a voltage/frequency control device operated in accordance with resistance variations of said secondary windings based on temperature changes of said rotary member sensed by said temperature sensor means to vector-control said power conversion device for enhancing the control of said elevator.

4,567,420

SEMI-CONDUCTOR MOTOR CONTROL SYSTEM

William H. Beck, Rancho Palos Verdes, Calif., assignor to Ross Hill Controls Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 496,688, May 20, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 597,902

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—803 **4 Claims**

1. An electrical circuit for varying the operation of a three phase electrical ac motor comprising,

an input circuit for providing a dc current output,

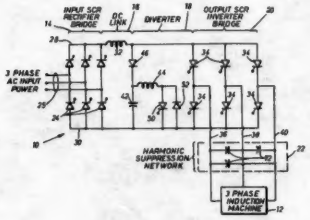
an output inverter bridge having six silicon controlled rectifiers for receiving dc current and converting the dc current to three phase ac power for operating a three phase electrical motor,

a diverter network means connected between the input circuit and the output inverter activated periodically for temporarily diverting the dc current output from the inverter in order that six silicon controlled rectifiers may be turned off,

said diverter network includes,

a tank circuit having a capacitor and inductor connected across the dc current output through a first diode,

an additional silicon controlled rectifier connected to said tank circuit for shunting off the dc current from the inverter and applying a reverse voltage to the inverter for turning off all of the silicon controlled rectifiers of the inverter, and



a second diode connected in parallel with the additional silicon controlled rectifier for providing a full cycle resonance of the tank circuit.

4,567,421

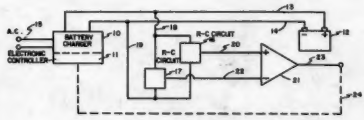
BATTERY DISCONNECT SENSING CIRCUIT FOR BATTERY CHARGING SYSTEMS

Donald P. Dattilo, 11621 Electron Dr., Louisville, Ky. 40299

Filed Oct. 6, 1983, Ser. No. 539,385

Int. Cl.⁴ H02J *7/00, 7/10*

U.S. Cl. 320—30 **10 Claims**



1. A battery disconnect sensing circuit for battery charging systems having a pair of cables adapted to be connected to a battery to charge it, said sensing circuit comprising a first R-C circuit adapted to connect across said cables, a second R-C circuit adapted to connect across said cables, the time constant of said first R-C circuit being substantially greater than that of said second RC circuit, and means connected to said RC circuits for producing a momentary control signal in response to disconnection of said cables from a battery being charged.

6. In a battery charging system including a source of charging current whose voltage output is controlled at a predetermined value when connected to a battery and increases to a higher value when disconnected from said battery, and controller means connected with said source to activate the battery charging system automatically in response to electrical connection thereof to said battery, the improvement which comprises:

means for momentarily effecting reversal of the higher voltage value, and battery disconnect sensing means connected said charging source and to said controller means for sensing said reversed higher voltage upon disconnection of said battery charger system from said battery and for responding thereto by automatically deactivating said battery charging system.

4,567,422

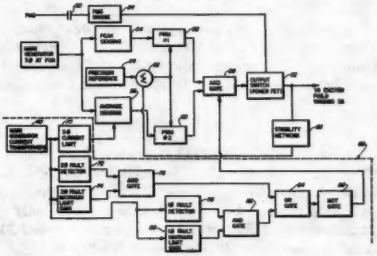
VOLTAGE REGULATOR WITH MAXIMUM CURRENT LIMIT

Cecil Sims, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 648,301, Sep. 7, 1984. This application Jul. 12, 1985, Ser. No. 754,426

Int. Cl.⁴ H02P *9/30*

U.S. Cl. 322—25 **13 Claims**



1. A voltage regulator for a generating system having a main generator and an exciter providing field current to the main generator, comprising:

means coupled to the main generator for sensing first, second and third operating parameters thereof;

means coupled to the sensing means for generating first, second and third pulse width modulated (PWM) signals based upon the first, second and third sensed operating parameters, respectively;

means coupled to the sensing means for developing a signal for modifying one of the first or second PWM signals based upon the third operating parameter thereof;

means coupled to the generating means for comparing first, second and third PWM signals and developing a fourth PWM signal responsive to the first, second or third PWM signal having the narrowest pulse width; and

means responsive to the comparing means for controlling the exciter to in turn regulate the output of the main generator.

4,567,423

PHASE SHIFTING TRANSFORMER ARRANGEMENT FOR DAMPING SUBSYNCHRONOUS OSCILLATIONS

Josip Dobsa, Oberrohrdorf, and Adel Hammad, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 9, 1984, Ser. No. 598,503

Claims priority, application Switzerland, Apr. 8, 1983, 1907/83

Int. Cl.⁴ H02P *9/00*

U.S. Cl. 322—58 **8 Claims**

1. A switching arrangement for increasing stability and damping subsynchronous oscillations in a polyphase power system, comprising:

a control winding that can be selectively connected in series with each phase winding of the power system, the control

voltages induced in said windings being phase displaced with respect to the voltages of the windings in the power system;

a switching unit for selectively connecting the control windings to the phase windings of the power system;

a measuring device for generating a measurement signal representative of a physical parameter of subsynchronous oscillations; and

control means responsive to said measurement signal for controlling said switching unit such that, when said control windings are connected to said phase windings, the net voltage across said phase windings is alternately phase shifted in two opposite directions of displacement in accordance with the polarity of said measurement signal.

4,567,424

REACTIVE POWER COMPENSATOR WITH CAPACITOR AND CAPACITOR DISCHARGE CIRCUIT

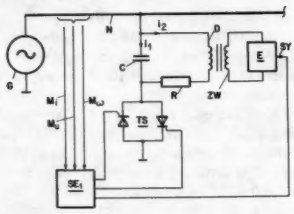
Josip Dobsa, Oberrohrdorf; Peter Mauchle, Wettingen; Walter Pfyl, Ennetbaden, all of Switzerland, and Kadry Sadek, Lauchringen, Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 2, 1984, Ser. No. 576,275

Claims priority, application European Pat. Off., Feb. 8, 1983, 83200196.0; Jan. 9, 1984, 84100127.4

Int. Cl.⁴ H02J *3/18*

U.S. Cl. 323—210 **30 Claims**



1. A reactive power compensator comprising:

at least one thyristor switch;

a capacitor connected in series with said thyristor switch;

a capacitor discharge circuit having at least one inductive reactive impedance continuously connected in parallel with said capacitor, said inductive reactive impedance having a variable inductance such that its value is greater when the thyristor switch is closed and is smaller when the thyristor switch is open; and

a control unit for the thyristor switch for generating triggering pulses for the thyristor switch from current and voltage measurement signals of an alternating-voltage network to be compensated.

4,567,425

METHOD OF AND APPARATUS FOR HALF-CYCLE-AVERAGE OR R.M.S. LOAD VOLTAGE CONTROL

Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,494

Int. Cl.⁴ G05F *1/44*

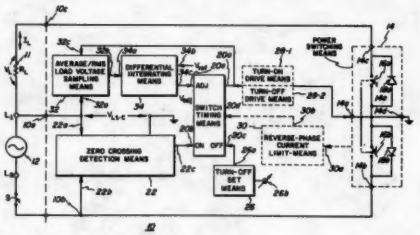
U.S. Cl. 323—237 **24 Claims**

1. A method for controlling a selected one of the half-cycle-average and RMS magnitude of an A.C. voltage applied across a load from a higher-magnitude A.C. source, comprising the steps of:

(a) providing switching means connected in series between the source and the load for selectively compieting the circuit therebetween;

(b) enabling the switching means to allow a flow of current through the load for at least one time interval during each source A.C. waveform cycle;

(c) sampling the magnitude of the voltage across the load once during only one half-cycle of each source waveform cycle to provide an adjustment signal; and



(d) adjusting, responsive to the adjustment signal, the time interval during which the switching means allows the flow of load current to vary the selected one of the half-cycle-average and RMS load voltage magnitude to a value substantially equal to a desired value.

4,567,426

CURRENT STABILIZER WITH STARTING CIRCUIT

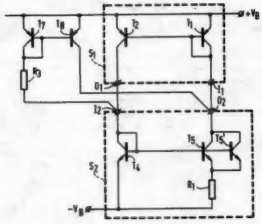
Rudy J. van de Plassche, Sunnyvale, Calif., and Peter J. M. Sijbers, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,062

Claims priority, application Netherlands, Apr. 5, 1983, 8301186

Int. Cl.⁴ G05F *3/16*

U.S. Cl. 323—315 **4 Claims**



1. A current stabilizing arrangement comprising a first and a second current path between a first and a second common terminal, a first current-dividing circuit comprising transistors of a first conductivity type and having an input circuit with a low input impedance and an output circuit with a high output impedance, and a second current-dividing circuit comprising transistors of a second conductivity type and also having an input circuit with a low input impedance and an output circuit with a high output impedance, the first current-dividing circuit defining the ratio between currents flowing in the two current paths and the second current-dividing circuit defining the absolute values of the currents flowing in the two current paths and having a semiconductor junction connected in parallel with a series arrangement of a semiconductor junction and a first resistor, which current-stabilizing arrangement also comprises means for starting the current-stabilizing arrangement, characterized in that the means comprises a first current-supply circuit which supplies a current to the input circuit of the second current-dividing circuit and a second current-supply circuit which supplies a current to the output circuit of the second current-dividing circuit, the currents supplied by the

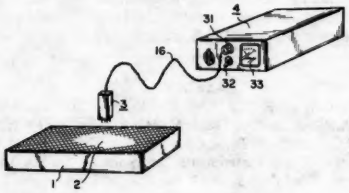
first and the second current-supply circuit having a ratio which is equal to the ratio between the currents in the two current paths as defined by the first current-dividing circuit.

4,567,427

METHOD NON-DESTRUCTIVELY IDENTIFYING DIFFERENT KINDS OF ROLLED STEEL FOR STRUCTURAL PURPOSES

Takeo Hattori, Yokohama, and Tohru Sasakura, Tokyo, both of Japan, assignors to Samtec Company Limited, Tokyo, Japan

Filed Dec. 30, 1983, Ser. No. 567,321
Claims priority, application Japan, Apr. 25, 1983, 58-71541
Int. Cl.[4] G01R *27/14*
U.S. Cl. 324—64 **6 Claims**



1. A method of non-destructively identifying different kinds of rolled steel for structural purposes comprising the steps of:
removing the coating film and/or oxide film of part of the surface of structural rolled steel under test to provide an exposed measuring surface;
holding the tips of four resistivity measuring terminal probes in forced contact with said measuring surface in along a straight line and at a uniform interval;
passing a current at a low frequency between the opposite end terminal probes in the row;
detecting the potential difference between the other two terminal probes than the opposite end terminal probes;
determining a resistivity corresponding to said detected potential difference;
determining a silicon content of the steel under test according to said determined resistivity;
and identifying the kind of the steel under test from said determined silicon content.

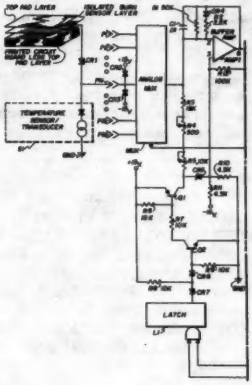
4,567,428

DETECTION OF CATASTROPHIC FAILURE OF DIELECTRIC, IMPROPER CONNECTION, AND TEMPERATURE OF A PRINTED CIRCUIT ASSEMBLY VIA ONE WIRE

Terry B. Zbinden, Maple Grove, Minn., assignor to Sperry Corporation, New York, N.Y.

Division of Ser. No. 395,511, Jul. 6, 1982, Pat. No. 4,504,782. This application Nov. 26, 1984, Ser. No. 675,050
Int. Cl.[4] H05K *1/00*; G01R *15/12*
U.S. Cl. 324—73 PC **5 Claims**

1. A multilayer printed circuit board comprising:
a plurality of electrically conductive layers, and
a plurality of electrically insulating layers, wherein one of said plurality of electrically insulating layers is an electrically isolated conductive layer normally of high resistance to all other voltages, signals, and grounds as exist upon other ones of said plurality of electrically conductive layers of said multilayer printed circuit board, but which said one electrically isolated conductive layer assumes a lower resistance to one or ones of said other voltages, signals and grounds if the electrically insulating dielectric of said multilayer printed circuit board is subject to carbonization by burning;



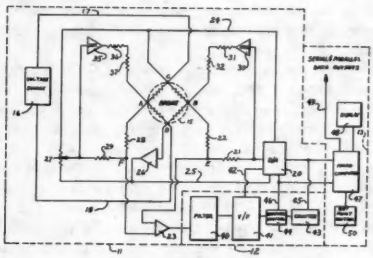
wherein said one electrically isolated conductive layer is suitable as a sensor to detect the failure of the electrically insulating dielectric of said printed circuit board.

4,567,429

DIGITAL SERVO INDICATOR

Robert A. Livsey, Richmond Hts., Ohio, assignor to Quest Corporation, Macedonia, Ohio

Filed Feb. 2, 1982, Ser. No. 344,940
Int. Cl.[4] G01R *17/06*
U.S. Cl. 324—99 D **8 Claims**



1. A digital servo indicator for producing an indication representing the measurement of an unknown voltage, comprising:
digital-to-analog conversion means including means for producing a variable known voltage from a constant reference voltage using a cascading series of circuits, each circuit having
a precision resistance element, and
a pair of solid-state, low-resistance switching elements for selectively connecting the constant reference voltage to the output through the resistance element to produce a desired known voltage;
means connecting the known voltage in opposition to the unknown voltage to produce an error signal from the difference therebetween;
voltage-to-frequency conversion means for producing a series of pulses from the error signal, the series of pulses having a repetition rate which maintains a constant proportionality to the magnitude of the error signal;
a bidirectional counter which counts the pulses and provides

a binary signal for continuously controlling the digital-to-analog conversion means;

means responsive to the polarity of the error signal for enabling the counter to be incremented by the pulses for one polarity and decremented by the pulses for the opposite polarity; and

a microcomputer means connected to the digital-to-analog conversion means for receiving the binary signal from the counter and for converting the binary signal to data representing the measurement of the unknown voltage.

4,567,430

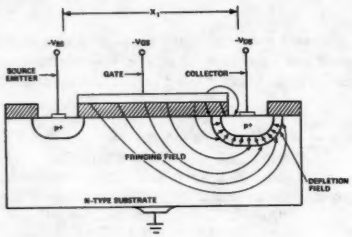
SEMICONDUCTOR DEVICE FOR AUTOMATION OF INTEGRATED PHOTOARRAY CHARACTERIZATION

William N. Carr, Dallas, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Continuation of Ser. No. 299,759, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 68,828, Aug. 22, 1979, abandoned. This application Feb. 26, 1985, Ser. No. 705,843

Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—158 D **3 Claims**



1. A method of determining the output current of a photodiode array fabricated on a semiconductor wafer comprising the steps of:

forming on the semiconductor wafer a field effect transistor having source, gate, and drain electrodes;

forming an opaque shield over the field effect transistor to prevent ambient light from affecting the drain current of the field effect transistor;

injecting a source current at the source electrode of the field effect transistor and measuring a drain current at the drain electrode of the field effect transistor; and

determining a nominal output current for the photodiode array by correlating the measured drain current of the field effect transistor with the nominal photodiode output current.

4,567,431

METHOD FOR REVEALING SEMICONDUCTOR SURFACE DAMAGE USING SURFACE PHOTOVOLTAGE (SPV) MEASUREMENTS

Alvin M. Goodman, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1983, Ser. No. 547,326

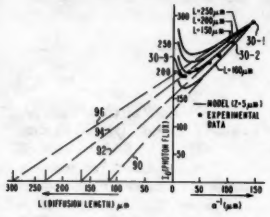
Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—158 R **10 Claims**

1. A method for revealing the presence of damage in the bulk surface region of a body of semiconductor crystalline material comprising the steps of:

(a) preparing a layer of the surface region to develop a stable inversion layer at the body surface;

(b) measuring the photon flux (I_o) as a function of the optical wavelength (λ) at a constant surface photovoltage to provide a plurality of data points forming a plot of photon flux (I_o) versus reciprocal optical absorption coefficient (α^{-1}); and



(c) determining the existence of curvature from said plot of said data points as an indicator of crystallographic damage in the material of said bulk surface region.

4,567,432

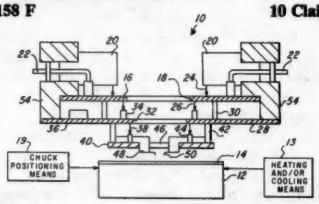
APPARATUS FOR TESTING INTEGRATED CIRCUITS

Douglas A. Buol, Dallas; Dean N. Mize; John W. Pattschull, both of Garland, and Robert M. Wallace, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 9, 1983, Ser. No. 490,001

Int. Cl.[4] G01R *1/06, 31/26*

U.S. Cl. 324—158 F **10 Claims**



1. Apparatus for testing integrated circuits on a semiconductor wafer, comprising:

a first planar support having upper and lower surfaces with a centrally located first opening therethrough at least as large as an integrated circuit to be tested for visual observation of the integrated circuits on the wafer and including a plurality of first connectors affixed to the upper and lower surfaces thereof peripherally about said first opening;

a second planar support having an upper surface spaced from the lower surface of said first support and having a centrally located second opening therethrough concentric with said first opening at least as large as an integrated circuit to be tested for visual observation of the integrated circuits on the wafer, said second planar support including a plurality of second connectors affixed to the upper surface thereof and located peripherally about said second opening, said second connectors being detachably coupled to said first connectors and thermally and mechanically isolated from said first support;

a plurality of probe supports affixed to the upper surface of said second support at the periphery of said second opening and extending radially inwardly therefrom;

a plurality of probes each affixed to a respective one of said plurality of probe supports and each having one end connected to a respective one of said plurality of second connectors, and the other end extending through said second opening below the lower surface of said second support to form a predetermined probe configuration;

means for positioning each integrated circuit of the semiconductor wafer so that predetermined locations of said integrated circuits are successively brought into contact with said plurality of probes;

a third planar support spaced apart from the upper surface of said first support and having a centrally located third opening therethrough concentric with said first and second openings, at least as large as an integrated circuit to be tested for visual observation of the integrated circuits, including a plurality of third connectors affixed to upper and lower surfaces thereof peripherally about said third opening, said lower surface third connectors being connected to said upper surface second connectors and being thermally and mechanically isolated from said first and second supports; and

means associated with said first, second, and third planar support means and said integrated circuit positioning means for thermally isolating said integrated circuits to enable said integrated circuits to be heated to about 100° C. and cooled to about 0° C. without affecting the temperature of said first, second and third planar support means.

4,567,433

COMPLEX PROBE CARD FOR TESTING A SEMICONDUCTOR WAFER

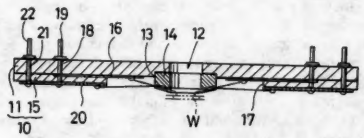
Masao Ohkubo, and Yasuro Yoshimitsu, both of Tokyo, Japan, assignors to Nihon Denshi Zairo Kabushiki Kaisha, Hyogo, Japan

Division of Ser. No. 266,054, May 21, 1981, Pat. No. 4,523,144. This application May 23, 1984, Ser. No. 613,346

Claims priority, application Japan, May 27, 1980, 55-73548[U]; Jul. 3, 1980, 55-91356

Int. Cl.⁴ G01R *1/06, 31/02*

U.S. Cl. 324—158 P **1 Claim**



1. A probe card for testing semiconductor wafers, comprising:

at least upper and lower printed circuit plates arranged in a stack, said printed circuit plates having inner central portions with apertures at their respective centers and also having outer peripheries with a plurality of bores therethrough,

said apertures being increasingly larger from the upper to the lower printed circuit plates so as to allow each central portion of said printed circuit plates to be exposed through said apertures,

probe needles arranged in radial arrays around said apertures, each of said radial arrays having multiple layers of probe needles,

said probe needles having tapered terminal tips aligned on a plane in parallel with but spaced from said printed circuit plates and also having opposite uniformly thick terminal ends,

each of a plurality of terminal rods passing through one of the plurality of bores in the outer peripheries of the printed circuit plates, and

a plurality of conductors spaced apart from each other and connecting each one of the terminal ends of the probe needles to a different one of the plurality of terminal rods, said plurality of conductors being aligned on parallel planes alternating with said printed circuit plates,

thereby enabling each of said terminal tips of said probe needles to be externally viewed from above through each of said apertures in the central portions of the printed circuit plates.

4,567,434

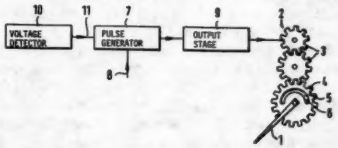
ANALOG DISPLAY DEVICE, PARTICULARLY A TACHOMETER

Christian Lindig, Kelkheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 424,671, Sep. 27, 1982, Pat. No. 4,475,082. This application Aug. 1, 1984, Ser. No. 636,531

Int. Cl.⁴ G01P *3/42;* G05B *19/40*

U.S. Cl. 324—160 **7 Claims**



7. In an analog display device, particularly a tachometer, having a pointer driven by a stepping motor and being resettable against a mechanical stop, a drive circuit for the stepping motor comprising:

a generator of electric pulses for energizing the motor to rotate through an increment of rotation for each of said pulses until said stop is reached, the torque of said motor varying inversely with a repetition frequency of said pulses in a sequence of the pulses,

means coupled to said generator for varying said repetition frequency from a relatively low value to a relatively high value so as to reduce the torque of said motor upon a reaching of said stop during a driving of said pointer towards said stop, and

means responsive to voltage from an ignition lock of a vehicle employing the display device for activating said generator.

4,567,435

METHOD AND APPARATUS FOR CONTINUOUSLY MEASURING DISTANCE UTILIZING EDDY CURRENT AND HAVING TEMPERATURE DIFFERENCE INFLUENCE ELIMINATION

Takeo Yamada, Yokohama; Tomohisa Yamamoto, Kawasaki; Seigo Ando, Yokohama, and Yoshihiro Kawase, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 583,021

Claims priority, application Japan, Mar. 9, 1983, 58-37259

Int. Cl.⁴ G01B *7/14;* G01F *23/00;* G01R *33/12*

U.S. Cl. 324—207 **2 Claims**

2. In an apparatus for continuously measuring a distance utilizing an eddy current, which comprises:

a probe comprising a bobbin, a primary coil provided coaxially with said bobbin at the center thereof, and a pair of secondary coils each provided at each of the end portions of said bobbin coaxially therewith on the both sides of said primary coil at equal distances therefrom, said probe being arranged substantially vertically to a high-temperature electro-conductive object of measurement at a distance therefrom; a positive feedback amplifier for exciting said primary coil by means of an output voltage (e_{out}) of said positive feedback amplifier, an AC voltage (e_1) and an AC voltage (e_2) being induced respectively in said pair of secondary coils by means of an AC magnetic field of said excited primary coil, an eddy current being generated in said object of measurement by means of said AC magnetic field of said primary coil, and another AC magnetic field in the direction opposite to that of said AC magnetic field of said primary coil being generated by means of said eddy current to produce a value of difference (e_3), caused by

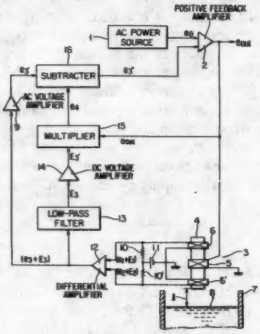
said another AC magnetic field generated by means of said eddy current, between said AC voltage (e_1) and said AC voltage (e_2) of said pair of secondary coils, said detected value of difference (e_3) varying in response to variation in the distance (1) between the tip of said probe and said object of measurement; and an AC power source for impressing an AC voltage having a prescribed frequency and a prescribed amplitude onto said positive feedback amplifier;

the improvement comprising:

a DC power source (11) for impressing an equal DC voltage through a DC resistance (10, 10') having an equal resistance value onto each of said pair of secondary coils (6, 6'), a DC voltage (E_1) and a DC voltage (E_2) being generated respectively in said pair of secondary coils (6, 6') by means of said DC voltage of said DC power source (11);

a differential amplifier (12) for continuously calculating a value of difference (e_3+E_3) between a composite voltage (e_1+E_1) of said AC voltage (e_1) and said DC voltage (E_1) of one (6) of said pair of secondary coils (6, 6'), on the one hand, and a composite voltage (e_2+E_2) of said AC voltage (e_2) and said DC voltage (E_2) of the other one (6') of said pair of secondary coils (6, 6'), on the other hand;

a low-pass filter (13) for passing only a value of difference (E_3) between said DC voltage (E_1) and said DC voltage (E_2), out of said value of difference (e_3+E_3) between said composite voltage (e_1+E_1) and said composite voltage (e_2+E_2);



a DC voltage amplifier (14) for amplifying said value of difference (E_3) between said DC voltage (E_1) and said DC voltage (E_2), which has passed through said low-pass filter (13);

another means (15) for continuously calculating an error voltage (e_4) corresponding to the difference in temperature between said pair of secondary coils (6, 6'), on the basis of the thus amplified value of difference (E_3') of said value of difference (E_3) between said DC voltage (E_1) and said DC voltage (E_2), and said output voltage (e_{out}) of said positive feedback amplifier (2);

a further another means (9) for passing only said value of difference (e_3) between said AC voltage (e_1) and said AC voltage (e_2) of said pair of secondary coils (6, 6'), out of said value of difference (e_3+E_3) calculated by said differential amplifier (12); and

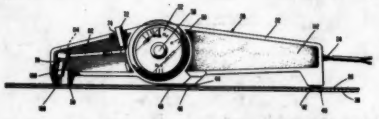
a subtracter (16) for continuously calculating a value of difference (e_3'') between said calculated error voltage (e_4) corresponding to said difference in temperature between said pair of secondary coils (6, 6'), on the one hand, and said value of difference (e_3), which has passed through said another means (9), between said AC voltage (e_1) and said AC voltage (e_2) of said pair of secondary coils (6, 6'), on the other hand, said value of difference (e_3'') calculated by said subtracter (16) being fed back to said positive feedback amplifier (2), to continuously determine said output voltage (e_{out}) of said positive feedback amplifier (2), from which the influence of said difference in temperature between said pair of secondary coils (6, 6') has been eliminated, whereby the distance (l) between the tip of said probe (3) and said object of measurement (8) is continuously and accurately measured by using said determined output voltage (e_{out}) of said positive feedback amplifier (2).

4,567,436

MAGNETIC THICKNESS GAUGE WITH ADJUSTABLE PROBE

Frank Koch, Ogdensburg, N.Y., assignor to Linda Koch, Ottawa, Canada

Filed Jan. 21, 1982, Ser. No. 341,337
Int. Cl.[4] G01B *7/10*; G01R *33/12*
U.S. Cl. 324—230 **17 Claims**



1. A gauge for magnetically measuring the thickness of a coating, comprising:

a housing;

a balance arm mounted to said housing about a pivot;

means for selectively urging one end of said balance arm into contact with said coating to be measured;

resilient means for providing a biasing force to urge said balance arm away from said coating to be measured;

probe means on said balance arm for providing a magnetically attracting force urging said one end of said balance arm toward said coating to be measured, said probe means comprising a contact member for contacting said coating, a magnet and an adjustable mount for selectively moving said magnet toward and away from said contact member, whereby said magnetically attracting force can be calibrated;

means for selectively varying the biasing force provided by said resilient means; and

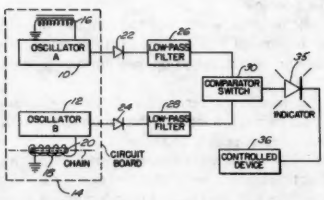
means for indicating the thickness of said coating to be measured.

4,567,437

DUAL OSCILLATOR METHOD FOR DETECTING FLAWS IN A MOVING CHAIN

Lincoln W. Hubbard, 52 Parkview Ave., Warwick, R.I. 02805

Filed Jun. 10, 1983, Ser. No. 502,938
Int. Cl.[4] G01N *27/82*; G01R *35/00*
U.S. Cl. 324—237 **1 Claim**



1. A method of detecting a flaw in a moving chain comprising the steps of providing two oscillators with ringing circuits having capacitive and inductive components; placing a brass core in the inductive component of the first oscillator; placing a perfect chain in the other inductive component; adjusting the

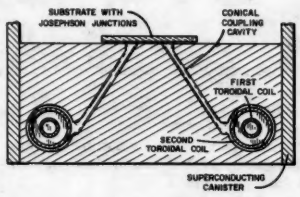
oscillatory amplitude of the first oscillator to be slightly greater than the other oscillator; noting the position of the brass core; replacing the perfect chain with a faulty chain and readjusting the brass core to the same output as before; noting the new position of the brass core and adjusting the core to a position between the noted positions to establish a threshold signal for a faulty chain; removing the faulty chain; providing a comparator and feeding the output of the two oscillators to the comparator; passing a moving chain through the said other inductive component to check for flaws whereby a faulty chain will cause a different output of the two oscillators and an output of the comparator as an indicator of the presence of a faulty chain.

4,567,438

SQUID CANISTER WITH CONICAL COUPLING CAVITY

Meir Gershenson; Mark F. Sweeny, both of St. Paul; Dennis D. Long, Pine City, and David L. Fleming, Edine, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 482,093
Int. Cl.[4] G01R *33/02*; H03K *3/38*
U.S. Cl. 324—248 **5 Claims**



1. A substantially solid superconducting canister holding within a first cavity a first circular electrical item of small circumference, and holding within a second cavity a circular second electrical item of circumference large relative to said small circumference of said first circular electrical item, and providing via a dielectric-filled coupling cavity between said first cavity and said second cavity an electromagnetically inductive intercommunication between said first circular electrical item and said second circular electrical item characterized in that:

said dielectric-filled coupling cavity is substantially of conical shape, meaning being of the three dimensional shape of a dunce's cap, wherein the vertex of said cavity of conical shape, or the circular cross section of said cavity of conical shape as truncated near said vertex, substantially subtends said first electrical item of small circumference, and wherein the circular base of said cavity of conical shape substantially subtends said second electrical item of circumference large relative to said small circumference of said first circular electrical item;

whereby the areas of said coupling cavity at any distance to either of said circular electrical items are minimized by said conical shape.

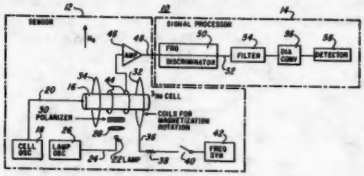
4,567,439

APPARATUS FOR MEASURING THE MAGNITUDE OF A MAGNETIC FIELD

Douglas D. McGregor, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 23, 1983, Ser. No. 535,200
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—304 **7 Claims**

1. Apparatus for rotating nuclear magnetization comprising a cell means containing a longitudinal nuclear magnetized substance, and a moment rotation producing means operatively connected to the cell, said moment rotation producing means including a switch for turning on and off the moment rotation producing means for establishing in the cell during the on time an oscillatory magnetic field in the substance substantially normal to the direction of the ambient field and for free precession during the off time.

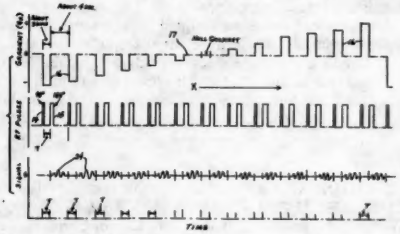


4,567,440

VIVO P-31 NMR IMAGING OF PHOSPHORUS METABOLITES

John C. Haselgrove, Johnson Research Foundation, School of Medicine, University of Pennsylvania, Philadelphia, Pa. 19104

Filed Jun. 9, 1983, Ser. No. 502,513
Int. Cl.[4] G01R *33/22*; G01N *24/06*
U.S. Cl. 324—309 **12 Claims**



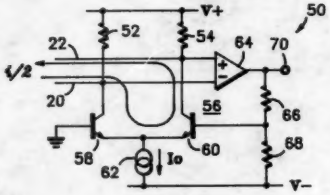
8. In an apparatus for obtaining spatial metabolite spectral information from a living body specimen, an NMR spectrometer including a hollow longitudinally extended main field magnet with a substantially uniform mangetic field therein and having a longitudinal axis, means to support a living body specimen in said magnet, and RF probe means mounted in said magnet in a position to be electromagnetically coupled to a specimen on said support means, said probe means being provided with means to sequentially apply RF resonance excitation pulses to such specimen and means to collect RF echo signals due to the refocussing of spins of atoms in the specimen generated responsive to the RF excitation pulses, and means to apply a timed series of discrete different-amplitude magnetic field gradient pulses to the interior of the main magnet adjacent said support means concurrently with the RF excitation pulses and being oriented so as to phase-encode nucleii of interest in the specimen at different points along a line adjacent to said probe means perpendicular to said longitudinal axis respectively in accordance with the amplitudes of said gradient pulses, wherein said series of gradient pulses are substantially linearly equally incremented in amplitude and includes one zero-amplitude stage relative to the uniform magnetic field strength of the NMR main magnet, and wherein the zero-amplitude stage occurs at the intermediate portion of the series of gradient pulses.

4,567,441

CIRCUIT AND METHOD FOR LINEARIZING THE OUTPUT SIGNAL OF AN FM DETECTOR

William E. Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1984, Ser. No. 595,871
Int. Cl.[4] H03D *3/06*
U.S. Cl. 329—103 9 Claims



1. Load circuit for linearizing the output signal produced at the differential outputs of a quadrature detector comprising load means coupled to the differential outputs of the quadrature detector, said load means having a non-linear transfer characteristic for producing a voltage at an output thereof that is a more linear version of the output signal appearing at the differential outputs of the quadrature detector, said load means including differential amplifier means having first and second inputs and outputs, said first and second outputs being coupled to the differential outputs of the quadrature detector respectively, said first input being coupled to a terminal at which is supplied a reference potential; and

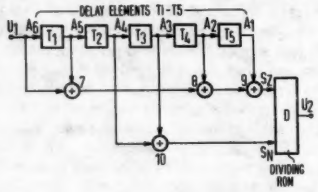
feedback circuit means coupled between said first and second outputs of said differential amplifier means and said second input thereof for providing an amplified output signal at an output of said feedback circuit means which is said more linear version of the output signal produced at the differential outputs of the quadrature detector.

4,567,442

METHOD AND APPARATUS FOR DEMODULATING TIME-DISCRETE FREQUENCY-MODULATED SIGNALS

Wolfgang Haussmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,856
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145919
Int. Cl.[4] H03D *1/00*
U.S. Cl. 329—145 4 Claims



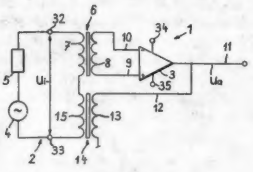
1. Method for demodulating a frequency-modulated signal, wherein said frequency-modulated signal is sampled at equidistant discrete times and several first and second sampled values are added to form first and second vector sums respectively, whereby the selection of the first and second sample values is made under the condition that in a mathematical vector representation of these sample values the difference in phase between the first and second vector sum is n times pi wherein n is any integer, and wherein, for obtaining an output signal which is proportional to the instantaneous frequency of the signal in the region of zero crossings the first vector sum is divided by the second vector sum.

4,567,443

LOW-DISTORTION AUDIO AMPLIFIER CIRCUIT ARRANGEMENT

Paul Zwicky, Dielsdorf, Switzerland, assignor to Willi Studer AG, Regensdorf, Switzerland

Filed Mar. 4, 1985, Ser. No. 708,171
Claims priority, application Switzerland, Mar. 21, 1984, 1415/84
Int. Cl.[4] H03F *1/26*
U.S. Cl. 330—149 12 Claims



1. A low-distortion audio amplifier circuit arrangement comprising:

an amplifier;

a source circuit;

said source circuit containing a current-voltage source;

a transformer operatively interconnecting said amplifier and said source circuit:

a negative feedback circuit operatively associated with said amplifier and coupled back to said source circuit;

a further transformer connected in series with said current-voltage source; and

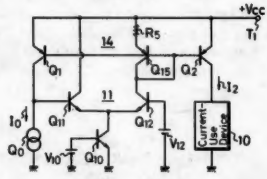
said further transformer coupling said negative feedback circuit to said current-voltage source of said source circuit.

4,567,444

CURRENT MIRROR CIRCUIT WITH CONTROL MEANS FOR ESTABLISHING AN INPUT-OUTPUT CURRENT RATIO

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,893
Claims priority, application Japan, May 26, 1983, 58-92698
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 3 Claims



1. A current mirror circuit for use with a reference potential and source of constant current, comprising:

first transistor means having an emitter connected to said reference potential and a collector connected to said source of constant current;

second transistor means of a polarity the same as said first transistor means and having an emitter connected to said reference potential and a base connected to a base of said first transistor;

differential amplifier means including third and fourth transistor means of polarity opposite that of said first and second transistor means, a base of said third transistor being connected to the collector of said first transistor;

bias voltage source means providing a bias voltage to a base of said fourth transistor and a collector of said fourth transistor being connected to the common base connection of said first and second transistors, whereby output current flowing in the collector of said second transistor has a predetermined ratio with the current flowing in said collector of said first transistor to which is connected said constant current source; and

fifth transistor means, a base of said fifth transistor means being connected to the common base connection of said first and second transistor means and a collector of said fifth transistor means being connected to the collector of said fourth transistor means.

4,567,445

HIGH INPUT IMPEDANCE LOW OUTPUT IMPEDANCE AMPLIFIER

Bengt O. Berg, Solna, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

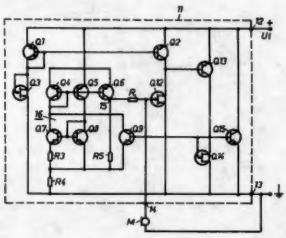
PCT No. PCT/SE83/00355, § 371 Date May 18, 1984, § 102(e) Date May 18, 1984, PCT Pub. No. WO84/01678, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 19, 1983, Ser. No. 616,212

Claims priority, application Sweden, Oct. 20, 1982, 83/00355; Oct. 20, 1982, 8205967

Int. Cl.⁴ H03F *3/16*

U.S. Cl. 330—300 **2 Claims**



1. An amplifier circuit powered by a low supply voltage source including an amplifier with a field-first effect transistor, a bipolar transistor and means for interconnecting the first field-effect transistor and the bipolar transistor to the low supply voltage source in such a manner that the base-emitter circuit of the bipolar transistor and the source-drain circuit of the first field-effect transistor are connected in series across the low supply voltage source, the improvement comprising that the first field-effect transistor is included in the first branch of a current mirror circuit also having an identical second branch which is a current generator branch including a second field-effect transistor identical to said first field-effect transistor, the gate of said second field-effect transistor being directly to the source of said second field-effect transistor, whereby the drain of said first field-effect transistor always follows the gate of said second field-effect transistor, and that the gate of the first field-effect transistor is connected to a biasing means having a temperature coefficient with the same absolute value but opposite in sign as the temperature coefficient of the base-emitter voltage of the bipolar transistor.

4,567,446

LIGHT-RECEIVING DEVICE FOR OPTICAL DATA TRANSFER SYSTEM

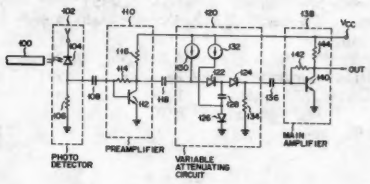
Kuniyoshi Konishi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 26, 1983, Ser. No. 535,629

Claims priority, application Japan, Sep. 29, 1982, 57-170354

Int. Cl.⁴ H03F *17/00*

U.S. Cl. 330—308 **4 Claims**



1. A light-receiving device which comprises:

photo-detecting means which converts a received light signal to a current signal;

a preamplifier for amplifying a current signal produced from said photo-detecting means;

varible attenuating means, which includes a variable resistance means, for attenuating a current signal produced from said preamplifier in accordance with the resistance of said variable resistance means and for sending forth a current signal thus attenuated; and

a main amplifier for amplifying said current signal produced from said variable attenuating means and issuing a signal thus amplified in the form of a voltage signal.

4,567,447

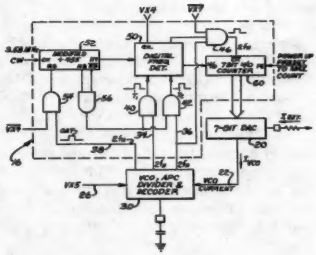
AUTO TUNING FOR AN OSCILLATOR

Gopal K. Srivastava, Buffalo Grove, and Ronald B. Lee, Skokie, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 3, 1983, Ser. No. 500,654

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—1 A **27 Claims**



1. An automatic tuning circuit for adjusting the free-running frequency of a controllable oscillator in a receiver comprising:

reference means for generating a stable reference signal;

means for free-running said controllable oscillator;

means coupled to said controllable oscillator for providing, based on the output of said oscillator, a derived signal comprising two timing signals representing the output of said oscillator at different phases and including test logic circuits for gating said two timing circuits to provide test times T1 and T2;

a detector circuit coupled to receive said reference signal and responsive to said test times T1 and T2 for determining if said oscillator is operating in a given frequency

range by detecting the presence of a desired relationship between the test times and the reference signal and providing an error signal indicative of said presence; and

adjustment means responsive to said error signal and controllingly coupled to the oscillator for adjusting its frequency based on said error signal.

4,567,448

VARIABLE FREQUENCY OSCILLATOR

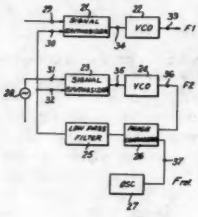
Masayuki Ikeda, Shiojiri, Japan, assignor to Epson Corporation, Suwa and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Aug. 4, 1983, Ser. No. 520,270

Claims priority, application Japan, Aug. 5, 1982, 57-136683; Aug. 5, 1982, 57-136684

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—25 **12 Claims**



1. A voltage-controlled oscillator circuit comprising:

first signal synthesizing means having first and second terminals receiving respective signals, said first synthesizing means combining said signals into one signal and delivering said combined signal;

second signal synthesizing means having the same characteristics as said first synthesizing means and having a first input terminal receiving a reference level signal and a second terminal;

a first oscillator circuit whose frequency of oscillation is controlled by said combined signal from said first synthesizing means;

a second oscillator circuit having the same characteristics as said oscillator circuit and controlled by a signal from said second synthesizing means; and

means for generating a reference frequency signal,

an output from said second oscillator circuit being compared in phase with said reference frequency signal by phase comparison means, the resultant signal being applied to said second terminal of said second synthesizing means to control the output frequency of said second oscillator circuit, said resultant signal also being applied to said second terminal of said first synthesizing means,

said first input terminal of said first synthesizing means acting as the control terminal of said voltage-controlled oscillator circuit, the output of said first oscillator circuit acting as the output of said voltage-controlled oscillator circuit.

4,567,449

LOW NOISE OSCILLATOR OPERATING IN THE ULTRA-HIGH FREQUENCY RANGE

Alain Bert, and Marc Camiade, both of Paris, France, assignors to Thomson-CSF, Paris, France

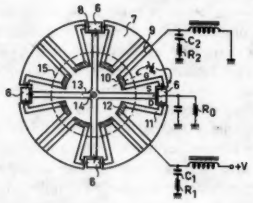
Filed Jun. 29, 1983, Ser. No. 508,914

Claims priority, application France, Jul. 2, 1982, 82 11659

Int. Cl.⁴ H03B *7/12*

U.S. Cl. 331—56 **11 Claims**

1. A low noise oscillator, operating in the ultra-high frequency range, comprising a plurality of transistors stabilized by a dielectric resonator coupled to a tuned microstrip line, wherein the plurality of transistors is grouped on the periphery of an insulating substrate plate, which supports said dielectric resonator, centered on the insulating substrate and of smaller size than the latter, and wherein each transistor is connected to at least one microstrip line supported by the substrate, said line



having a broken U-configuration, such that the two end portions of the microstrip line are parallel to the field lines of the resonator and the central portion, covered by the resonator and perpendicular to its field lines, is coupled to said resonator.

4,567,450

FIN-LINE OSCILLATOR

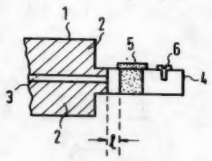
Laszlo Szabo, Korntal, and Klaus Schünemann, Braunschweig, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,530

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230831

Int. Cl.⁴ H03B *7/00*; H01P *1/00*

U.S. Cl. 331—107 DP **4 Claims**



1. Fin-line oscillator comprising a waveguide containing a fin line having fins, a diode as an active element which is housed in a package (5), and an impedance-matching network for matching the diode to a load and determining the frequency, characterized in that the waveguide (1) containing the fin line is connected with a cutoff waveguide (4), that the fins (2) of the fin line extend into the cutoff waveguide (4), that the diode package (5) is disposed in the cutoff waveguide and electrically connected to the top or bottom side of the cutoff waveguide, and that a suitable distance (l) between the fin ends and the diode package and a suitable width of the slot between the fins as well as a suitable value of capacitance in the cutoff waveguide are chosen to determine the frequency and match the diode to the load.

4,567,451

RESONATOR HAVING OPTICAL FEEDBACK COUPLING

John C. Greenwood, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 1, 1983, Ser. No. 500,129

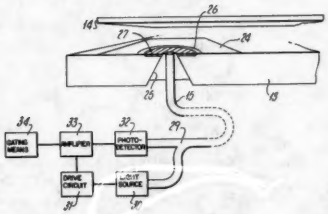
Claims priority, application United Kingdom, Jun. 10, 1982, 8216846

Int. Cl.⁴ G01L *1/10*; H03B *5/30*

U.S. Cl. 331—155 **9 Claims**

1. In a resonator device of the type having: a substrate; a pair of end mount means both secured to said substrate; filament

means mounted between said end mount means for torsional vibration; paddle means integral with said filament means and located intermediate said end mount means to participate in said torsional vibration; and oscillation driving means for driving said paddle means to perform said torsional vibration, and including means for sensing said torsional vibration, and in



response thereto providing positive feedback to sustain said torsional vibration; the improvement wherein:

said filament means is integral with said mount means; and

said filament means comprises a plurality of individual filaments, each of which is integral with said end mount means and said paddle means.

4,567,452

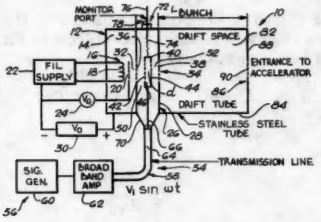
BROAD-BAND BEAM BUNCHER

David A. Goldberg, Walnut Creek; William S. Flood, Berkeley; Allan A. Arthur, Martinez, and Ferdinand Voelker, Orinda, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 20, 1984, Ser. No. 591,651

Int. Cl.⁴ H01J *25/10*

U.S. Cl. 332—7 **10 Claims**



1. A broad-band beam buncher, comprising:

a housing adapted to be evacuated,

an electron gun in said housing for producing a beam of electrons,

buncher means in said housing forming a buncher cavity having an entrance opening for receiving the electron beam and an exit opening through which the electron beam passes out of said buncher cavity,

a drift tube electrode in said buncher cavity and disposed between said entrance opening and said exit opening with first and second gaps between said drift tube electrode and said entrance and exit openings,

said drift tube electrode having a first drift space therein through which the electron beam passes in traveling between said entrance and exit openings,

modulating means for supplying an ultrahigh frequency modulating signal to said drift tube electrode for producing velocity modulation of the electrons in the electron beam as the electrons pass through said buncher cavity and said drift tube electrode between said entrance opening and said exit opening,

drift space means in said housing forming a second drift space for receiving the velocity modulated electron beam from said exit opening,

said velocity modulated electron beam being bunched as it passes along said second drift space,

said drift space means having a discharge opening through which the electron beam is discharged from said second drift space after being bunched therein,

said modulating means comprising a signal source for producing an ultrahigh frequency signal,

a transmission line connected between said signal source and said drift tube electrode, and

terminating means connected to said drift tube electrode for terminating said transmission line in approximately its characteristic impedance to afford a broad response band with minimum variations therein.

4,567,453

ACOUSTIC SURFACE WAVE DEVICE

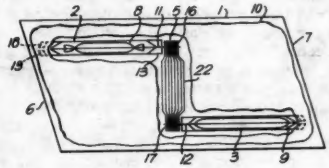
John Schofield, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 16, 1983, Ser. No. 532,877

Claims priority, application United Kingdom, Sep. 20, 1982, 8226703

Int. Cl.⁴ H03H *9/145, 9/64, 9/42*

U.S. Cl. 333—194 **29 Claims**



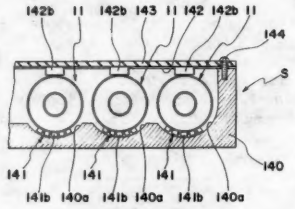
1. An acoustic surface wave device comprising a piezoelectric substrate for propagating a surface acoustic wave at a surface thereof, transducer means for launching surface acoustic wave energy into a first propagation track at said surface and for converting surface acoustic wave energy propagating along a second non-overlapping propagation track into an electrical signal, and a multistrip coupler comprising a first array of electrically conductive strips arranged in said first track and a second array of electrically conductive strips arranged in said second track, each array comprising discrete parallel electrically conductive strips electrically insulated from one another, said discrete conductive strips of one array being electrically connected by means of corresponding electrically conductive connecting strips to respective said discrete conductive strips of the other array, surface acoustic wave energy launched by said transducer means along said first track being received by said first array and at least a part of that energy being relaunched as surface acoustic wave energy into said second track so as to be received by said transducer means, characterized in that adjacent boundaries of said first and second propagation tracks, as defined by the aperture of the corresponding transducer means, are spaced from one another, and the spacing of said electrically conductive connecting strips is different throughout the major portion of the length of each said connecting strip from the wide-aperture-beam spacing of the electrically conductive strips in either array such that the amount of acoustic wave energy launched in the substrate region between said first and second arrays within the desired pass-band of the device is substantially reduced or minimized with respect to the acoustic energy that would be launched if the spacing were equivalent to that in either said first or said second array.

4,567,454

RESONATOR DEVICE

Koji Saito, Takatsuki, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 27, 1984, Ser. No. 604,494
Claims priority, application Japan, May 2, 1983, 58-66686[U]
Int. Cl.[4] H01P 1/205, 7/04
U.S. Cl. 333—206 11 Claims



1. A resonator device, comprising;
an electrically conductive mounting member;
at least one axially extending dielectric coaxial resonator having an electrically open axial end and an opposite end axially opposite said electrically open end, including a dielectric member formed with an axially extending bore, an inner conductor member formed on a radial periphery of said bore, and an outer conductor member formed on a radially outer periphery of said dielectric member;
means, including an elastic member located between said dielectric coaxial resonator and said mounting member, for securing said dielectric coaxial resonator to said mounting member only elastically, through said elastic member and electrically pressing said dielectric coaxial resonator into electrical contact with said mounting member; and
an elastic piece interposed between said opposite end of said dielectric coaxial resonator and said mounting member;
said mounting member being formed with a stopper projection contacting said electrically open end of said dielectric coaxial resonator;
said dielectric coaxial resonator being secured between said elastic piece and said stopper projection so as to be prevented from being displaced axially.

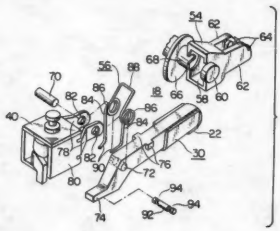
4,567,455

CIRCUIT INTERRUPTER

Setsuo Hosogai; Hiroshi Fujii; Shigemi Tamaru; Junichi Terachi; Takuo Takatsuka, all of Fukuyama, and Hideo Suhara, Fukayasu, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,982
Claims priority, application Japan, May 16, 1983, 58-74205[U]; May 16, 1983, 58-74206[U]; May 16, 1983, 58-74207[U]; May 16, 1983, 58-74208[U]; May 16, 1983, 58-74209[U]; May 16, 1983, 58-74210[U]; May 16, 1983, 58-74211[U]
Int. Cl.[4] H01H 75/12
U.S. Cl. 335—16 11 Claims

1. A circuit interrupter comprising in an electrically insulating housing:
a pair of separable contact structures each including a contact element, at least one of said contact structures being movable between a closed position and an open position relative to the other contact structure for opening and closing an electric circuit extending through the circuit interrupter;
said movable contact structure having an arm support that is pivotal about an axis, a movable contact arm pivotally supported on said arm support, and a biasing means connected between said arm support and said movable contact arm for biasing said movable contact arm to a predetermined position with respect to said arm support; and
an operating mechanism connected to said arm support of said movable contact structure for separating said movable contact structure from said other contact structure;



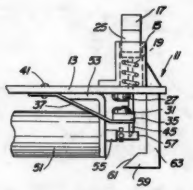
said housing having formed therein a stopper surface, and
said movable contact arm having a stopper projecting from said movable contact arm and engageable with said stopper surface on said housing for limiting the range of movement of said movable contact arm.

4,567,456

RESETTABLE CIRCUIT CLOSING DEVICE

Raymond H. Legatti, Clearwater, Fla., assignor to Technology Research Corporation, Clearwater, Fla.

Filed Jun. 13, 1983, Ser. No. 503,868
Int. Cl.[4] H01H 73/00, 83/00, 3/00
U.S. Cl. 335—20 16 Claims



1. A resettable circuit closing device that is opened in the event of an undervoltage condition comprising:
contact means biased to a normally open position;
mechanical actuating means for mechanically forcing said contact means to a closed position when in a flexed position;
adjusting cam means flexing said actuating means to said flexed position; and
electrically energized holding means engaging said actuating means to permit closing of said contact means, by keeping said actuating means in the flexed position after flexing by said adjusting means only when a voltage applied across said holding means exceeds a predetermined level.

4,567,457
ELECTROMAGNETIC RELAY

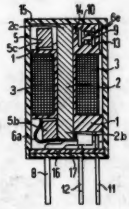
Helmut Schedele, Diessen, and Rolf-Dieter Kimpel, Unterschweinbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,497

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329239

Int. Cl.⁴ H01H *51/06, 67/02*

U.S. Cl. 335—128 **11 Claims**



1. An electromagnetic relay comprising:

a base body carrying a coil winding,

a core yoke having its center section embedded in said base body and which has a yoke leg extending perpendicular to the coil axis at both ends outside of said coil winding;

a U-shaped armature seated on said core yoke, the central part thereof residing parallel to the coil axis and embracing said coil winding, and its two lateral legs extending essentially perpendicular to said coil axis;

said armature having its first lateral leg seated on the first yoke leg so as to be pivotable around an axis perpendicular to said coil axis and having its second lateral leg forming a working air gap relative to the second yoke leg; and

a contact spring secured to the middle part of said armature, the free end of said contact spring carrying a contact piece embracing said armature and said core yoke and interacting at that side of said core yoke opposite said armature with a least one cooperating contact plate anchored in said base body.

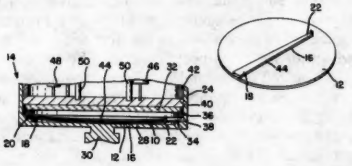
4,567,458
THERMOSTATIC SWITCH

Richard L. Englund, King County, Wash., assignor to Index Industries, Inc., Bellevue, Wash.

Filed Aug. 15, 1984, Ser. No. 641,038

Int. Cl.⁴ H01H *37/54*

U.S. Cl. 337—365 **21 Claims**



1. A thermostatic switch, comprising:

a conductive plate;

a bimetallic disc positioned adjacent to said plate and spaced therefrom, said disc being movable between two oppositely dished configurations with a snap action in response to changes in temperature; and

an electrically conductive, resilient arm of a different metallic composition than said disc, said arm being fixedly attached by an anchored end to said disc at a perimeter portion thereof and having a movable contact end, said movable contact end having no separate contact element and moving with said disc between two positions corresponding to said disc configurations, said movable contact end yieldably engaging said plate in one position and said disc in the other position, whereby the natural frequency of said arm is increased and the vibration sensitivity of the switch is decreased.

4,567,459
TRANSMISSION METHOD FOR VARIABLE MEASURED VALUES FROM VEHICLE WHEELS UTILIZING AMBIENT TEMPERATURE COMPENSATION

Josef Folger, Munich; Hans-Dieter Fournell, Haar; Hans-Rudolf Hein, Munich; Karl Kapfhammer, Germering; Josef Rambock, and Michael Weber, both of Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

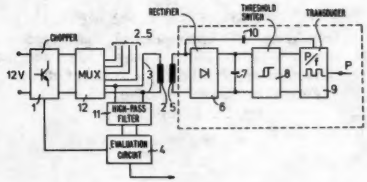
PCT No. PCT/EP81/00113, § 371 Date Apr. 5, 1982, § 102(e) Date Apr. 5, 1982

PCT Filed Aug. 5, 1981, Ser. No. 367,234

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029563

Int. Cl.⁴ B60C *23/00*

U.S. Cl. 340—58 **10 Claims**



1. In combination, a system for sending an information signal indicative of variable measured values from wheels of a vehicle, wherein energy is transmitted from a primary coil to a secondary coil mounted concentrically on at least one of said wheels during excitation of said primary coil mounted external of said wheels and fixedly connected with the vehicle, and said information signal, which is a function of the output signal of a sensor means located in said at least one of said wheels, is fed back from said secondary coil to the primary coil,

the improvement comprising compensation means responsive to said primary coil for temperature-compensating said information signal, said compensation means including

ambient temperature sensor means located external of said wheels for producing a set value indicative of ambient temperature about said vehicle; and

an evaluation circuit for comparing the information signal with said set value whereby to correct representations of information signal due to changes in temperature.

4,567,460
TESTING DEVICE APPARATUS AND METHOD FOR TIRE PRESSURE OF AUTOMOTIVE VEHICLE WHEELS

Eugen Gebler, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,274

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151254

Int. Cl.⁴ B60C *23/00, 23/02*

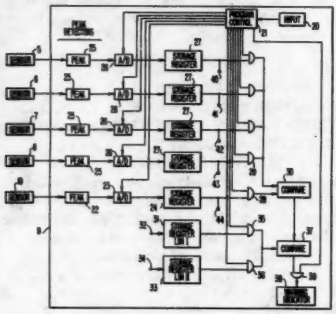
U.S. Cl. 340—58 **10 Claims**

1. A testing apparatus for wheeled road vehicles having suspension members for the wheels comprising

first means mounted at the suspension members for sensing a

characteristic of the suspension member adjacent each wheel with respect to the road,

calibration means for sensing tire pressure of at least the tire of one of said wheels, and



second means responsive to an output signal from said first means and to a signal from said calibration means for producing an output warning signal.

4,567,461

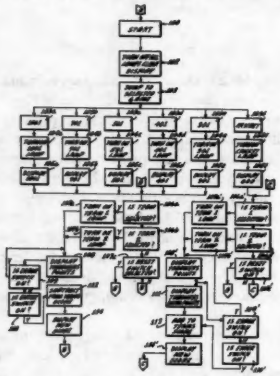
ELECTRONIC DART GAME SCOREBOARD

Robert D. Honekman, 5014 Blackhorse Rd., Palos Verdes, Calif. 90274, and Curt Fisher, Palos Verdes, Calif., assignors to Robert D. Honekman, Rancho Palos Verdes, Calif.

Filed Feb. 22, 1983, Ser. No. 468,172

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—323 R 7 Claims



1. An electronic dart game scorer comprising in combination:

first and second numerical score display means;

a plurality of game select switches including a cricket game select switch;

computer means responsive to actuation of any one of said game select switches for displaying a particular beginning score associated with each of said switches on both said first and second display means; and

team select means for selecting one of said first and second display means for score updating; and

score entry means connected to said computer means for updating said beginning score to derive successive intermediate game scores on said selected display means;

auxiliary input means connected to said computer means and associated with said cricket game select switch, said auxiliary input means being actuatable for registering dart landings in particular beds of a dartboard;

auxiliary display means associated with said auxiliary input means for displaying each such registered dart landing apart from said numerical score display means.

said updating consisting of either addition or subtraction of individual numerical throw score entries made through said score entry means, actuation of a particular game select switch being operative for presetting said computer means to perform either said addition or subtraction of all throw score entries made subsequent to actuation of the particular game select switch.

4,567,462

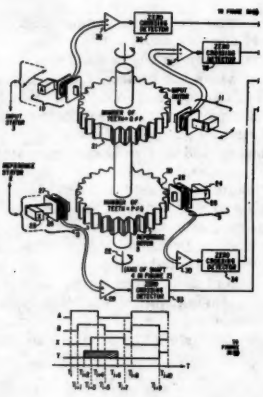
METHOD AND APPARATUS FOR REDUCING CROSSTALK EFFECTS UPON PHASE MEASUREMENT

Robert W. Leiby, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 25, 1983, Ser. No. 479,046

Int. Cl.[4] G08C *9/06*

U.S. Cl. 340—347 P 8 Claims



1. A transducer comprising:

first and second rotors journalled for simultaneous and identical rotation about an axis, each having a different number of poles along respective first and second peripheries;

means for rotating the first and second rotors about the axis;

first sensor means disposed adjacent the first periphery and responsive to the passage of poles thereon for producing a periodic first sensor signal as the first rotor rotates; and

second sensor means disposed adjacent the second periphery, journalled for orbital revolution about the axis and around the second periphery and responsive to the passage of poles thereon for producing a periodic second sensor signal whose phase relative to the first sensor signal is a function of the orbital position of the second sensor means.

4,567,463

CIRCUIT FOR IMPROVING THE PERFORMANCE OF DIGITAL TO ANALOG CONVERTERS

Jimmy R. Naylor, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 23, 1982, Ser. No. 351,542

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 DA 11 Claims

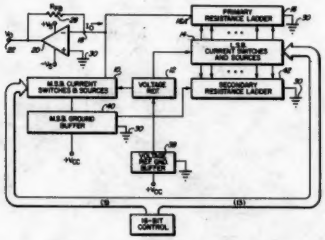
1. A digital to analog converter comprising:

most significant bit current switches and sources;

least significant bit current switches and sources;

a primary resistance network coupled to said least significant bit current switches and sources and to a ground terminal, said primary resistance network having an output coupled to said most significant bit current switches, each of said least significant bit current switches and sources applying current to said primary resistance network when said each least significant bit current switches and sources are in a first state;

most significant bit ground buffer means coupled to said most significant bit current switches and sources for re-



ducing a current flowing from analog ground through said most significant bit current switches; and

secondary resistance network means coupled to said least significant bit current switches and sources and to said ground terminal, each of said least significant bit current switches and sources applying current to said secondary resistance means, said secondary resistance network means for providing an analog ground current contribution when said each least significant bit current switch and source is in a second state generally equal to an analog ground current contribution.

4,567,464

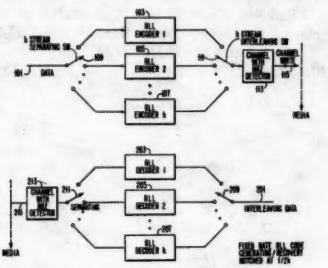
FIXED RATE CONSTRAINED CHANNEL CODE GENERATING AND RECOVERY METHOD AND MEANS HAVING SPECTRAL NULLS FOR PILOT SIGNAL INSERTION

Paul H. Siegel, Palo Alto, Calif., and Stephen J. Todd, Winchester, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,842

Int. Cl.⁴ H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**



1. A method for frequency band limited encoding of a datastream such that the encoded representation exhibits a spectrum notched at selected frequencies within the band, comprising the steps of:

forming a concordance of selected state transitions of a lattice-type finite state transition encoding space with selected run length limited (RLL) encoded symbols such that any succession of transitions is well correlated with an RLL symbol stream, the spectrum of the NRZ representation of each RLL stream being notched at the selected frequencies;

one-to-one mapping of each datastream into an RLL symbol stream by fixed rate length-oriented recursive arithmetic encoding of ssaid datastream according to the concordance; and

transforming each mapped RLL symbol stream into an NRZ representation.

4,567,465

METHOD AND APPARATUS FOR CONVERTING ANALOG SIGNAL INTO DIGITAL SIGNAL

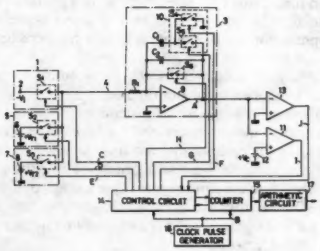
Koji Komiya, Hachioji, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,610

Claims priority, application Japan, May 25, 1982, 57-88504; Apr. 6, 1983, 58-61314

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 AD **16 Claims**



1. A method of converting an analog voltage of a polarity to a digital value, which comprises:

(a) providing an integrator having a predetermined normal output voltage and including first and second integrating capacitors;

(b) integrating an analog input voltage for a preassigned period of time by the integrator;

(c) integrating a first reference input, opposite in polarity to the analog input voltage, by the integrator after the lapse of the preassigned period of time, until the output voltage of the integrator reaches a predetermined level;

(d) transferring a charge on the first integrating capacitor to the second integrating capacitor, and electrically isolating the first integrating capacitor from the integrator, when the output voltage of the integrator reaches the predetermined level;

(e) integrating a second reference input by the integrator with use of the second integrating capacitor upon completion of the charge transfer from the first to the second integrating capacitor, until the output voltage of the integrator becomes equal to the predetermined normal output voltage thereof;

(f) measuring the periods of time during which the first and second reference inputs are being integrated; and

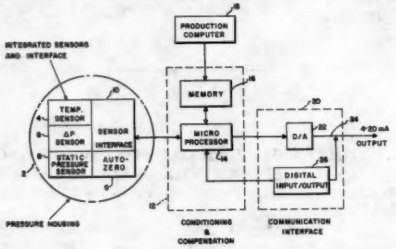
(g) providing a digital output corresponding to the analog input voltage on the bases of the preassigned period of time during which the analog input voltage has been integrated, the measured periods of time during which the first and second reference inputs have been integrated, and the values of the first and second reference inputs.

4,567,466

SENSOR COMMUNICATION SYSTEM

Theodore B. Bozarth, Perkasie; Anthony M. Demark, Plymouth Meeting; Edward F. Finn, Warminster, and Frank Lynch, Hatboro, all of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1982, Ser. No. 447,818
Int. Cl.⁴ H03M *1/10*
U.S. Cl. 340—347 AD **4 Claims**



1. An analog signal communication system comprising

an input multiplexer for selecting one of a plurality of analog input signals, one of said analog input signals being a compensation signal obtained from a temperature responsive circuit,

a variable gain amplifier means for amplifying an output signal from said input multiplexer,

a free running triangle wave generator,

a comparator means connected to said amplifier and said generator for comparing an output signal from said variable gain amplifier and said generator to produce a variable duty cycle output signal representative of the amplitude of the output signal from said variable gain amplifier,

means for converting said variable duty cycle output signal to a digital word,

an input selector for controlling said input multiplexer to select said analog input signals,

a range selector for selecting a gain level of said variable gain amplifier, and

a digital signal handling means connected to said means for converting to receive said digital word and for concurrently controlling said input selector and said range selector whereby said input selector is controlled by said signal handling means to select said compensation signal for each gain level selected by said range selector wherein said variable gain amplifier means includes a pair of amplifiers arranged to receive an output signal from said input multiplexer and each having a variable feedback impedance controlled concurrently by said range selector.

4,567,467

ANGULAR ROTARY POSITION ENCODER

Wayne T. Wibiin, Ashtabula; Grant C. Melocik, Chardon; Edward V. Leskovec, Eastlake, and William Pickering, University Heights, all of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Feb. 21, 1984, Ser. No. 582,113
Int. Cl.⁴ H03K *13/18*
U.S. Cl. 340—347 P **14 Claims**

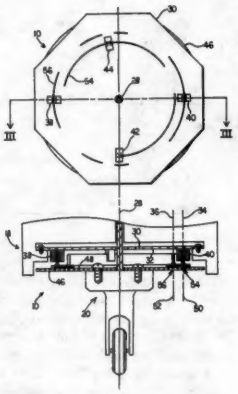
1. Apparatus for encoding the position of a steerable wheel portion of a vehicle relative to a non-steerable portion of said vehicle, said steerable wheel portion being rotatable left and right of a central position about an axis, comprising:

a first mounting member having a first planar surface and first and second curvilinear sensor pathways, said first mounting member being connected to said non-steerable portion of said vehicle, said first planar surface being substantially perpendicular to said axis, and said first and second sensor pathways being concentrically positioned about said axis on said first planar surface;

first and second sensors positioned diametrically opposite one another along one of said first and second curvilinear sensor pathways;

third and fourth sensors positioned other than diametrically opposite one another along the other of said first and second curvilinear sensor pathways;

a second mounting member having a second planar surface and third and fourth curvilinear sensor pathways, said



second mounting member being connected to said steerable wheel portion of said vehicle and rotatable about said axis, said second planar surface being substantially parallel to and facing said first planar surface, and said third and fourth sensor pathways being concentrically positioned about said axis on said second planar surface; and,

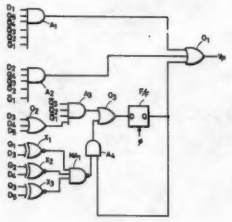
first and second pluralities of sensible light blocking members extending outward from said second planar surface and being respectively positioned along said third and fourth sensor pathways.

4,567,468

MODULATION CIRCUIT OF A DIGITAL-TO-ANALOG CONVERTER

Shinichi Tanaka, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1983, Ser. No. 535,310
Claims priority, application Japan, Sep. 24, 1982, 57-166853
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 DA **18 Claims**



1. A method of converting a data train of digital data codes into an analog representation thereof, said digital data codes including an N bit higher order code portion and an M bit lower order code portion, where N and M are natural numbers, comprising the steps of:

converting each said digital data code into a code train of pulses, said code train of pulses being developed over a predetermined time period, a said digital data code representative of zero being converted by said step of converting into an absence of pulses during said predetermined time period; and

integrating each said code train of pulses developed by said step of converting to develop an analog valve associated therewith and thereby develop an analog waveform from said data train;

said step of converting including the steps of,

pulse number modulating said M bit lower order code portion of each said digital data code to develop a number of pulses in said code train of pulses equal to the digital value of said M bit lower order code portion,

pulse width modulating said N bit higher order code portion of each said digital data code to develop a plurality of width modulated pulses in said code train of pulses one greater in number than the maximum number of pulses developed by said step of pulse number modulating, each of said plurality of width modulated pulses increasing in width in relation to the digital value of said N bit higher order code portion.

4,567,469

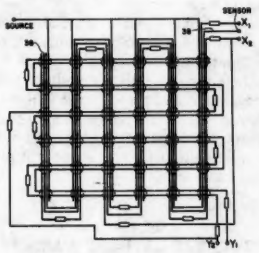
MATRIX KEYBOARD

Sherif Danish, and Hugh H. Aiken, both of Tulsa, Okla., assignors to Polytel Corp., Sunnyvale, Calif.

Filed Jan. 14, 1983, Ser. No. 458,132

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—365 S **11 Claims**



1. In a multikey keyboard for inputting data to a computer wherein the X and Y rank of the pressed key is determined by the closing of a corresponding key switch that brings into the X and Y keyboard output circuits selected portions of at least a pair of separate series of electrical elements whose respective cumulative values are subsequently measured by the computer to uniquely establish the coordinates of the pressed key, the specific improvement comprising: providing said keyboard with a sensor circuit means comprising a keyboard output sensor terminal electrically connected to a first additional conductor circuit wherein said conductor circuit is operatively connected to each of said key switches; and further providing said keyboard with a signal source circuit means comprising a keyboard input signal terminal electrically connected to a second additional conductor circuit wherein said second additional conductor circuit is operatively connected to each of said key switches, such that when a key is pressed, said signal source circuit means is brought into circuit with said sensor circuit means thus triggering the computer to measure said cumulative values that establish the coordinates of the pressed key.

4,567,470

TOUCH SENSING DEVICE

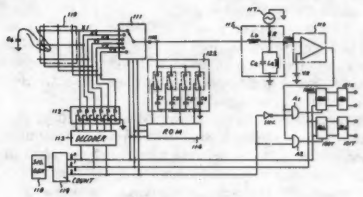
Kazuo Yoshikawa; Hisashi Yamaguchi, and Toru Asano, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 25, 1983, Ser. No. 488,399

Claims priority, application Japan, Apr. 30, 1982, 57-73785

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—365 C **4 Claims**



1. In a touch sensing device comprising a plurality of sensing electrodes positioned to correspond to locations to be sensed, and a sensing circuit for sensing when a selected one of said sensing electrodes is activated, wherein said sensing circuit senses the activation of a sensing electrode by sensing a change in the electrical characteristics of said sensing electrode when said sensing electrode is activated, the improvement comprising a compensating circuit means for compensating for fluctuations in the electrical characteristics of each sensing electrode, said compensating circuit means comprising a plurality of compensating elements, wherein the number of said compensating elements is less than the number of said sensing electrodes; memory means for storing data for selecting predetermined ones of said compensating elements for providing the compensation required for each of said sensing electrodes; and connecting means coupled to said compensating elements and to said memory means for connecting said predetermined ones of said compensating elements to said sensing circuit, whereby the fluctuations of the electrical characteristics of said activated sensing element sensed by said sensing circuit, is compensated for.

4,567,471

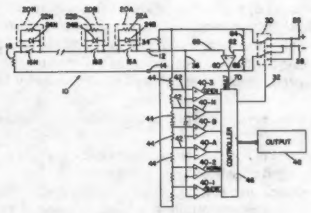
MONITORING SYSTEM

Mustafa Acar, Syosset, N.Y., assignor to Pittway Corporation, Syosset, N.Y.

Filed Aug. 8, 1983, Ser. No. 521,615

Int. Cl.[4] G08B *29/00*

U.S. Cl. 340—513 **15 Claims**



1. A monitoring system for a protection loop that has a plurality of switches in series comprising

a monitoring module connected across each said switch, each said monitoring module including first and second devices connected in parallel with one another, each said first device having an asymmetric response characteristic and each said second device having a symmetrical re-

sponse characteristic, said modules being connected across said switches so that each said first device is poled in the same direction,

means to apply first and second interrogating signals alternately to said protection loop, each said first device having a response to said each first interrogating signal that is less significant than the response of its paralleled second device to said first interrogating signal and a response to said second interrogating signal that is more significant than the response of said paralleled second device to said second interrogating signal;

first comparator circuit means operative to provide an output in response to said first interrogating signal when one of said monitored switches in said protection loop is open as indicated by the response of said second devices to said first interrogating signal, and

second comparator circuit means operative to provide an output in response to said second interrogating signal when more than one of said monitored switches in said protection loop is open as indicated by the response of said first devices to said second interrogating signal, and

means responsive to the outputs of said comparator circuit means for indicating the status of said monitored switches in said protection loop.

4,567,472

SECURITY-ENSURING APPARATUS HAVING AN OPERATIONAL GUIDANCE FUNCTION

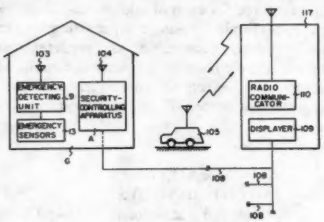
Shiro Shirai, Tachikawa; Shunji Ogahara, Musashino, and Miyuki Kubo, Tokyo, all of Japan, assignors to Secom Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 503,739, Jun. 13, 1983, Pat. No. 4,536,749. This application May 14, 1985, Ser. No. 734,315

Claims priority, application Japan, Jun. 14, 1982, 57-100749

Int. Cl.[4] G08B *25/00*

U.S. Cl. 340—525 **4 Claims**



1. An information-displaying security-ensuring apparatus having an operational guidance function for displaying information regarding the security of protected areas as well information regarding operating procedures for said apparatus, said apparatus being accommodated in a single casing and adapted for use in an alarm system having emergency sensors for sensing emergency conditions occurring in a plurality of predetermined protected areas being monitored for security by a central station, one said apparatus being installed in each of said plurality of predetermined protected areas and comprising in combination:

detecting means for detecting emergency signals sensed by said emergency sensors;

memory means for storing therein display information including information on the type and location of said emergency sensors in a protected area;

emergency-discriminating means operably coupled to said detecting means and said memory means for discriminating the type and site of an emergency condition on the basis of detected signals from said detecting means and said information on the type and location of said emergency sensors supplied thereto from said memory means; and

display means operably coupled to said emergency-discriminating means for displaying said type and site of said emergency condition discriminated by said emergency-discriminating means and for displaying information regarding operating procedures for said apparatus.

4,567,473

RESONANT TAG AND DEACTIVATOR FOR USE IN AN ELECTRONIC SECURITY SYSTEM

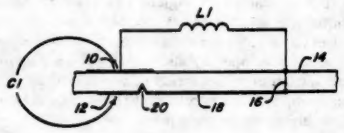
George J. Lichtblau, 13 Tannery Hill Rd., Ridgefield, Conn. 06877

Continuation of Ser. No. 376,777, May 10, 1982. This application Nov. 20, 1984, Ser. No. 673,265

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—572 **27 Claims**



1. For use in an electronic security system which includes means for providing in a controlled area an electromagnetic field of a frequency which is swept within a predetermined range, and means for detecting the presence of a resonant tag circuit having a resonant frequency within said range, a resonant tag circuit comprising:

a planar substrate of dielectric material;

a tuned circuit on said substrate in circuit configuration and resonant at said frequency;

said tuned circuit having a pair of conductive areas on respective opposite surfaces of the substrate to define a capacitor of the tuned circuit; and

means within the conductive areas defining a path between the conductive areas and through the substrate at which an arc discharge will preferentially occur in response to an electromagnetic field at said frequency of sufficient energy, and operative to destroy the resonant properties of the tuned circuit.

4,567,474

FREEZER ACCIDENTAL DEFROST WARNING DEVICE

Dale Wolin, Eagle, Id., assignor to Temco Products Corporation, Boise, Id.

Filed Jun. 6, 1983, Ser. No. 501,757

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—584 **10 Claims**

1. A temperature indicating device comprising:

a battery;

indicator means;

a temperature probe comprising a negative temperature coefficient thermistor;

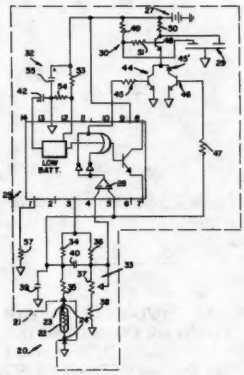
first circuitry means for detecting the output voltage of said battery, and for generating an output signal when an input comparator thereof detects an abnormal input condition;

second circuitry means for determining whether or not said probe is operatively connected to said first circuitry means and said indicator means; said second circuitry means consisting of an NPN Darlington transistor and a resistor, said Darlington transistor operatively connected to said indicator means by a diode; and

third circuitry means operatively interconnecting said battery, indicator means, and first and second circuitry means for actuating said indicator means should said battery output voltage be below a predetermined value, or should said temperature probe be operatively disconnected, or

should the temperature sensed by the temperature probe rise above a predetermined value;

said third circuitry means including, in combination with said probe, adjustable voltage measuring means operatively connected to said input comparator of said first circuitry means for allowing adjustment of the temperature at said probe at which said indicator means is actuated, and for effecting actuation of said indicator means when the temperature at said probe is within about ±3 percent of the adjusted temperature setting, wherein said adjustable voltage measuring means comprises a voltage



measurement bridge comprising a variable side including first and second resistors and said thermistor, and a reference side including third and fourth resistors and a variable resistor, wherein each of said resistors of said voltage measurement bridge are accurate to about one percent; and

high and low pass filter capacitors operatively connected to said voltage measurement bridge, said high pass filter capacitor being operatively connected to said voltage measurement bridge variable side at a point between said first and second resistors, and connected to said reference side at a point between said third and variable resistors.

4,567,475

GAS OR VAPOR ALARM SYSTEM INCLUDING SCANNING GAS SENSORS

Stanislaw Bukowiecki, Uerikon; Gustav Pfister, Uetikon; Alfons Reis, Stäfa; Alan P. Troup, Männedorf, and Hans-Peter Ulli, Zurich, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Apr. 1, 1983, Ser. No. 481,375

Claims priority, application Switzerland, Apr. 15, 1982, 2290/82

Int. Cl.⁴ G08B *17/10*

U.S. Cl. 340—634 **13 Claims**

1. A gas or vapor alarm system comprising:

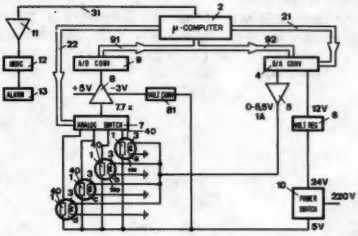
at least one heatable sensor element for generating an output signal in dependency upon the presence of a gas or vapor;

heating means for continuously changing the temperature of said sensor element through at least two temperature cycles from a starting value to an upper threshold value in accordance with a predetermined pattern and thereafter back to said starting value according to a preselected pattern, which patterns are optimized with respect to selective ones of said gases or vapors;

said output signal of said sensor element varying during said temperature cycles as a function of the composition of said gas or vapor;

an electronic circuit for receiving the output signals of the sensor element; and

said electronic circuit comparing the variation of said output signal during said temperature cycle of said sensor element with stored ones of such variations which are characteristic for the presence of predetermined components of said gas or vapor.



4,567,476

METHOD AND CIRCUIT FOR OPTICAL AND/OR ACOUSTIC INDICATION OF THE CHARGE STATE OF A BATTERY OR A STORAGE BATTERY

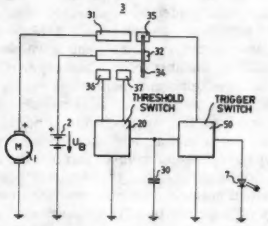
Gerhard Lang, Altweilnau, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Dec. 30, 1983, Ser. No. 567,098

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300284

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—636 **10 Claims**



1. A circuit for monitoring the charge state of a storage battery (2) for supplying energy to an electrical consumer preferably a direct current motor (1) through a mode selector switch (3) being movable between an OFF-state wherein said electrical consumer (1) is disconnected from said battery (2) and at least one ON-state wherein said electrical consumer (1) is connected with said battery (2), said circuit comprising a threshold switch (20) an input of which is connected to said battery (2) in the ON-state of said selector switch (3) and the output of which is connected to both a capacitor (30) and a control input of a trigger switch (50),

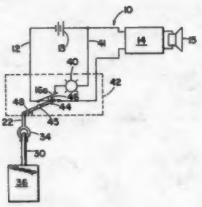
an input of said trigger switch (50) being connected to said battery (2) when said mode selector switch (3) is in the OFF-state and an output of said trigger switch (50) being connected to a display device (7),

said threshold switch (20) being applied with the voltage of said battery (2) when said mode selector switch (3) is in the ON-state whereby said threshold switch (20) sets said trigger switch (50) when the voltage of said battery (2) has dropped below a predetermined value, said trigger switch (50) after having been actuated by said threshold switch (20) actuates said display device (7) for a predetermined period when said mode selector switch (3) is in the OFF-state.

4,567,477
SMOKE DETECTOR SWITCH INDICATOR

Laurent L. Cormier, 484 Trudeau St., Ville LaSalle, Quebec, Canada (H8R 3C4)

Continuation-in-part of Ser. No. 504,607, Jun. 15, 1983, abandoned. This application Sep. 4, 1984, Ser. No. 647,266
Int. Cl.[4] G08B *21/00, 17/10*
U.S. Cl. 340—644 5 Claims



1. In a fire alarm system including a circuit connecting a smoke detector with an alarm and having a power source connected in the circuit for energizing the alarm when the smoke detector senses an unsafe smoke condition, a temporary disabling and warning device for disabling the alarm and indicating the disabled condition comprising:

an electrical switch in the circuit having an open circuit condition to prevent the alarm from sounding in the presence of a smoke condition, and a normally closed circuit condition in which the system is operative; and

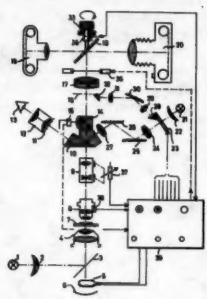
weighted disabling and indicating means operatively associated with the electrical switch and including a weight sensitive operating member connected with the electrical switch to actuate the switch between the normally closed and the open circuit condition, and a weighted actuating and indicating member releasably engageable with the weight sensitive operating member by means of a resilient coupling to actuate the electrical switch from the normally closed to the open circuit condition when the weight of the actuating and indicating member is supported by the operating member through the coupling, the resilient coupling having a resilient member maintaining the weighted actuating member and the operating member coupled together in a freely suspended condition of the actuating member, and resiliently releasing the actuating member from the operating member upon the application of a downwardly directed force to the actuating and indicating member in the suspended condition to thereby allow the electrical switch to assume the normally closed condition, the actuating and indicating member also having a visual indicator visible when the weight of the member is supported by the operating member and the circuit of the smoke detector is open.

4,567,478
LIQUID-CRYSTAL DISPLAY FOR MICROSCOPES

Klaus Schwab, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkichen, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,754
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208917
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—705 9 Claims

1. A photomicroscope, comprising an objective, a camera, a viewing ocular, optical means including a beam splitter and determining a first intermediate-image plane in a path to said camera and a second intermediate-image plane in a separate path to said viewing ocular, a luminous display field including means for displaying thereon a plurality of indicia some of which are to be presented at the ocular-viewed field and others of which are to be presented at the photographic field of said camera, first optical-imaging means built into the microscope and imaging a first localized area of said display field at both said intermediate-image planes, and second optical means built

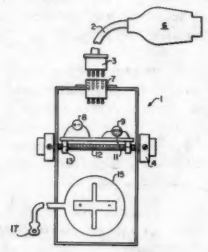


into the microscope and imaging a second localized area of said display field at one to the exclusion of the other of said intermediate-image planes.

4,567,479
DIRECTIONAL CONTROLLER APPARATUS FOR A VIDEO OR COMPUTER INPUT

Barry S. Boyd, 4649 N. 23rd St., Arlington, Va. 22207

Filed Dec. 23, 1982, Ser. No. 452,687
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—709 1 Claim



1. A cranially supported computer input device for use with a computer, comprising a switch control housing having a first set of position-responsive switches and a second set of position-responsive switches arranged relative to said first set of position responsive switches, a vacuum-pressure-operated switch in said housing, means in said housing for adjusting a position of one set of said sets of switches to a horizontal position, cranial support means for cranially supporting said housing, and circuit means connecting said sets of switches and said vacuum-pressure-operated switch to said computer, whereby different functions of said computer are controlled by the position of said switches and the state of said vacuum-pressure-operated switch.

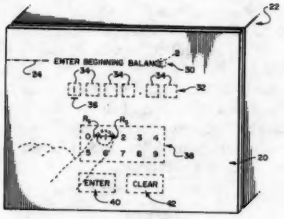
4,567,480
TOUCH-SENSITIVE OVERLAY

Randall D. Blanchard, Woodinville, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Dec. 13, 1982, Ser. No. 448,947
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—712 34 Claims

1. A touch-sensitive overlay for placement on a visual dis-

play including a system for illuminating areas at a plurality of locations in said display and responsive to an electrical signal to provide an indication of an illuminated area location in said display, comprising: a substantially transparent sheet having a plurality of discrete photoreactive transducer means distributed thereon and placeable over said illuminated area location, the photoreactive transducer means having at least one photoelectric characteristic which varies as a function of incident light from said illuminated area location in said display impinging said transducer means, and circuit means for obtaining from said transducer means said electrical signal in response to a variation of said photoelectric characteristic due to incident light from said illuminated area in said display at said transducer means coincident with an external touch of said overlay to identify the location of said touch relative to said display.



4,567,481

MEASURING INSTRUMENT DISPLAY WITH EXCHANGEABLE LEGENDS FOR DIFFERENT LANGUAGES OR OPERATING MODES

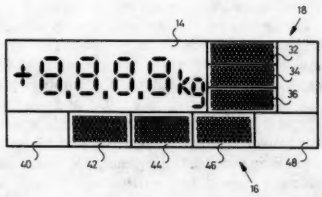
Linus Meier, Saland, and Roland Hanselmann, Hegnau, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Jan. 27, 1983, Ser. No. 461,439

Claims priority, application Switzerland, Mar. 19, 1982, 1710/82; Sep. 10, 1982, 5391/82

Int. Cl.⁴ G09G *3/02, 3/18, 3/36*

U.S. Cl. 340—784 **17 Claims**



1. Display for a measuring instrument, comprising

symbol carrying means carrying at least one alpha-numeric symbol in a predetermined area, said at least one alpha-numeric symbol constituting a legend to be displayed;

substantially planar blocking means having a preselected area aligned with said predetermined area, said preselected area including an electrode configuration having a light blocking or light transmissive state in accordance with the absence or presence of a control signal applied thereto, said electrode configuration defining a pattern of conductive regions connected to one another, which in turn define a plurality of non-conductive zones between said conductive regions, respectively, thereby permitting said symbol carrying means to be viewed, or covered from view, respectively,; and

means for applying said control signal to said blocking means only when said measuring instrument is in a predetermined operating condition, whereby said at least one alpha-numeric symbol is displayed only when said measuring instrument is in said predetermined operating condition, whereby both an effective light blockage, as well as a relatively low power consumption of said blocking means is realized.

4,567,482

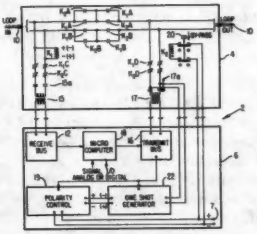
BYPASS CONTROL FOR STATIONS IN A COMMUNICATION SYSTEM

Philip C. Dolsen, Richmond Heights, Ohio; Satish Chandra, Springfield, Va.; Gordon R. Hammon, and William J. Uren, both of Mentor, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 12, 1982, Ser. No. 440,910

Int. Cl.⁴ H04Q *9/00*; H04J *3/02*

U.S. Cl. 340—825.05 **6 Claims**



1. A communication system for transmitting intelligence by means of high frequency bits between a control station and a series of remote stations having the ability to remotely bypass selected remote stations comprising:

a communication loop having the control station and the remote stations serially connected therein;

each remote station having a bypass module physically separated from a communications module but electrically coupled thereto;

each communication module having means for generating a D.C. pulse of forward or reverse polarity in response to a control signal from the control station and transmitting said polarity signal to the bypass module of the next serially connected remote station;

each bypass module having means for electrically disconnecting and reconnecting its associated communication module from said communication loop while itself remaining in said loop responsive to said forward or reverse polarity signal from the communication module of the preceeding remote station.

4,567,483

POSITION BASED GROUND PROXIMITY WARNING SYSTEM FOR AIRCRAFT

Charles D. Bateman; Michael M. Grove; Lyle J. Noland, and Wallace E. Ward, all of Bellevue, Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 10, 1982, Ser. No. 448,862

Int. Cl.⁴ G08B *23/00*; G01S *13/00*

U.S. Cl. 340—970 **29 Claims**

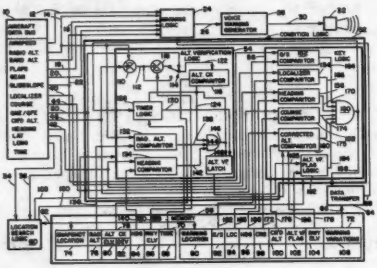
1. A ground proximity warning system for aircraft comprising:

a source of signals representing aircraft flight parameters;

warning logic means operatively connected to said source of flight parameter signals for comparing said flight parameter signals and generating a warning signal in response to predetermined relationships between selected flight parameter signals;

a source of position signals representing the position of the aircraft; and

condition logic means operationally connected to said warning logic means and said source of position signals for



varying said predetermined relationships when the aircraft is in a predetermined warning location.

4,567,484

DOPPLER RADAR MEASURING APPARATUS

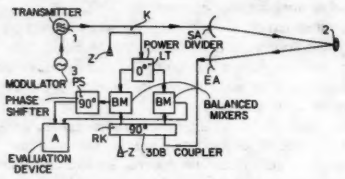
Wolfram Schilz, Norderstedt, and Burkhard Schiek, Bochum/-Querenburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 491,005, May 3, 1983, abandoned, which is a continuation of Ser. No. 216,466, Dec. 15, 1980, abandoned. This application May 18, 1984, Ser. No. 611,926

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950626

Int. Cl.[4] G01S *13/00, 13/26, 13/34*

U.S. Cl. 343—14 **2 Claims**



1. A doppler radar apparatus for surveillance of an area lying within a predetermined operating range, comprising:

(a) a transmitter for producing a radio frequency signal at an output thereof;

(b) a modulator coupled to the transmitter for momentarily modulating said radio frequency signal during succesive periods of duration T at a predetermined modulation frequency, said modulation frequency corresponding to a wavelength which is at least four times the operating range of the apparatus;

(c) a transmit antenna coupled to the transmitter for transmitting the modulated radio frequency signal across the area;

(d) a receive antenna for receiving a reflection of the transmitted signal from an object within the area;

(e) mixer means coupled to said transmitter output and to said receive antenna for mixing the transmitted and received signals and for producing a difference frequency signal representing the range of said object, said mixer means comprising:

(1) a power divider for coupling the transmitter output to first and second outputs thereof;

(2) a 90° coupler having an input coupled to the receive antenna and having first and second outputs for providing 90° phase-shifted replicas of the received signal;

(3) a first balanced mixer coupled to the first output of each of the power divider and the 90° coupler for mixing the transmitted signal and one of the replicas of the received signal, and for producing at an output thereof a first difference frequency signal;

(4) a second balanced mixer coupled to the second output of each of the power divider and the 90° coupler for mixing the transmitted signal and the other one of the replicas of the received signal, and for producing at an output thereof a second difference frequency signal; and

(5) a 90° phase shifter coupled to the output of the first balanced mixer for producing at an output of the phase shifter a 90° phase-shifted replica of the first difference signal; and

(f) an evaluation device, coupled to the outputs of the 90° phase shifter and the second balance mixer, for sampling the difference frequency signal during each period at a predetermined instant when the difference frequency signal amplitude is a maximum.

4,567,485

EARTH STATION TRANSMISSION POWER CONTROL SYSTEM FOR KEEPING AN EIRP OF DOWN LINK SIGNALS CONSTANT IRRESPECTIVE OF WEATHER

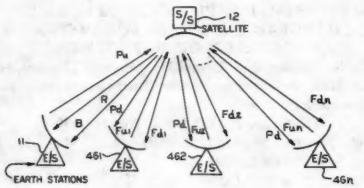
Goro Oshima; Satoru Ono, and Yasuhisa Shimada, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 441,617, Nov. 15, 1982, abandoned. This application Apr. 23, 1985, Ser. No. 725,528

Claims priority, application Japan, Nov. 16, 1981, 56-183294; Nov. 16, 1981, 56-183295; Nov. 16, 1981, 56-183297

Int. Cl.[4] H04B *7/185*

U.S. Cl. 343—358 **2 Claims**



1. A transmission power control system for use in at least one first earth station of a satellite network which includes at least one second earth station for sending a pilot signal to a satellite, said transmission power control system comprising first means responsive to a gain control signal for amplifying a test or transmission signal with a variable gain and sending to said satellite the test or transmission signal with a controllable transmission power dependent upon said variable gain, second means for receiving and detecting the pilot signal transmitted via said satellite to said first earth station, third means for receiving and detecting the test or transmission signal transmitted via said satellite to said first earth station, fourth means for comparing the outputs of said second and third means and for providing said gain control signal responsive thereto, thereby making said satellite radiate a signal with an effective isotropically radiated power kept substantially constant irrespective of a rain loss.

4,567,486

PHASE DIFFERENCE MEASUREMENT TECHNIQUE FOR VOR

Arlen E. Breiholz, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 7, 1983, Ser. No. 464,229

Int. Cl.[4] G01S *1/44*

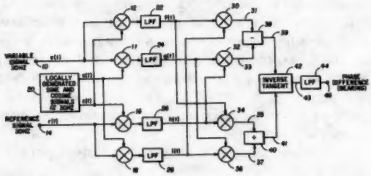
U.S. Cl. 343—401 **12 Claims**

1. A signal processing system comprising:

means for receiving a first signal;

means for receiving a second signal having a phase difference with respect to said first signal;

means for multiplying each of said first and second signals with a sine and cosine signal to produce a plurality of product outputs;



means for combining said product outputs to produce sine and cosine outputs of the phase difference between said first and second signal; and

means for providing an output of the inverse tangent of the sine output divided by the cosine output as a representation of the phase difference between said first and second signal.

4,567,487

VIBRATION-TOLERANT WHIP ANTENNA

Charles W. Creaser, Jr., Hollis, N.H., assignor to Chu Associates, Inc., Littleton, Mass.

Filed Jun. 15, 1984, Ser. No. 620,874

Int. Cl.[4] H01Q *1/10, 1/20*

U.S. Cl. 343—900 **9 Claims**

1. A mechanical vibration-tolerant whip antenna having, in combination, a multi-section conical metal tube having successive sections joined by internal rigid reinforcing member means tightly fitting within corresponding recesses in the respective ends of adjacent sections and with the outer metal surfaces of the successive sections providing a continuous smooth external metal surface transition, the lengths of the sections being selected to locate mechanical vibration stress points at their adjacent ends, and each reinforcing member means extending sufficiently above and below such stress points to provide rigid support to the same.

4,567,488

THERMAL HEAD DRIVE DEVICE

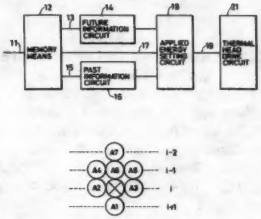
Haruhiko Moriguchi; Toshiharu Inui; Masayuki Hisatake, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,936

Claims priority, application Japan, Dec. 28, 1983, 58-245420

Int. Cl.[4] H05B *1/00*

U.S. Cl. 346—76 PH **9 Claims**



1. A thermal head drive device for applying to an aimed data heater element of a thermal head a pulse to record aimed data in one of several lines of picture data, said device comprising:

first means for storing data representing lines of said picture data already recorded;

second means for storing data representing lines of said picture data intended to be recorded after the line of said picture data containing said aimed data is printed, and

means, coupled to said first and second storing means, for determining, from the line of said picture data containing said aimed data and from said data stored in said first and second storing means, the amount of energy in said pulse to be applied to said aimed data heater element to record said aimed data.

4,567,489

THERMAL PRINTHEAD FOR THERMOGRAPHIC PRINTER

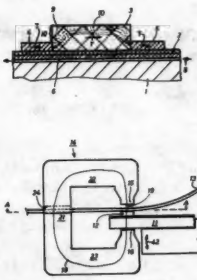
Günther Obstfelder, Panoramastrasse 28, 6940 Weinheim-Lützelsachsen; Gerhard Kreutze, Kirchenstrasse 38, and Winfried Lüttig, Lange Acker 16, both of 6901 Neckarsteinach, all of Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 568,095

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1983, 3300104

Int. Cl.[4] H05B *1/00*

U.S. Cl. 346—76 PH **19 Claims**



1. A thermal printhead for a thermal printer comprising:

(a) an electrically-insulating substrate;

(b) resistors arranged on an electrically-insulating substrate in a print line to form impression points;

(c) current supply and current discharge leads bonded to the resistors; and

(d) means for forming a magnetic field to act upon the resistors in the immediate proximity of the resistors and along the resistor print line, the magnetic field being directed such that when current flows through the resistors, the current paths within the resistors are deflected upwardly into the upper portion of the resistor to the surface thereof.

4,567,490

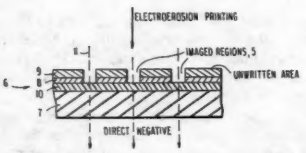
ELECTROEROSION RECORDING MEDIUM OF IMPROVED LUBRICITY

Ali Afzali-Ardakani, Katonah; Mitchell S. Cohen, Ossining; Keith S. Pennington, Somers, and Krishna G. Sachdev, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,300

Int. Cl.[4] G01D *15/34;* **B05D** *5/12;* **B32B** *5/16;* **G03C** *5/24*

U.S. Cl. 346—135.1 **17 Claims**



1. Electroerosion recording material comprising: a non-conductive support member, a thin conductive member, said conductive member being evaporable in response to arcing and high local temperatures obtained in an electroerosion recording process, and an overlayer of protective lubricant composition applied from a liquid onto the stylus-contacting surface of said conductive member, said lubricant composition comprising discrete graphite fluoride particles alone as a solid lubricant or in combination with conductive particles of high lubricity dispersed in a polymeric binder, the particle sizes of said graphite fluoride being in the range 0.05–5 micrometers and the particle size of the conductive particles being in the range 0.05–5 micrometers, the density of said overlayer being from about 2 to 20 micrograms per square centimeter, and the ratio of binder to lubricant particles in said overlayer being sufficient substantially to provide smudge resistance and prevent flake-off during handling and use of said material.

4,567,491

PINCH ROLLER ASSEMBLY

James Lawrence, Irvine, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 23, 1984, Ser. No. 633,171

Int. Cl.[4] G01D *15/28*

U.S. Cl. 346—136 **5 Claims**

1. In a graphics plotter having a rotatable drum, a pinch roller for holding a writing medium against the surface of the drum for longitudinal movement thereby, and a carriage track disposed above and parallel to the drum for supporting a pen block carriage for traverse movement, the improvement comprising:

(a) a supplemental track carried by the carriage track and extending downward therefrom, said supplemental track being an inverted T-shape in cross section;

(b) a pinch roller carriage having a pair of spaced parallel side members, each having a pair of facing L-shaped gripping members extending upward therefrom, said gripping members being adapted to fit loosely about said supplemental track whereby said pinch roller carriage hangs therefrom and is easily slideable traversely along said supplemental track;

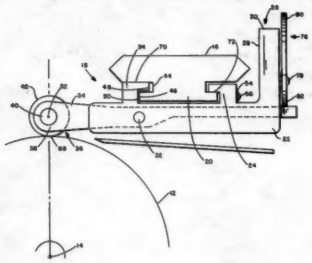
(c) a first pivot pin disposed between said side members and normal thereto at about the location of the ones of said gripping members closest to the drum;

(d) a pivot arm pivotally mounted on said first pivot pin and extending between said side members, one end of said pivot arm terminating above the drum in a yoke having a pair of parallel spaced side pieces lying in planes normal to said pivot pin, the other end of said pivot arm extending past the portion of said supplemental track furthest from the drum;

(e) a second pivot pin disposed between said side pieces and normal thereto;

(f) a pinch roller mounted on said second pivot pin for rotational movement;

(g) first bias means carried by said pinch roller carriage for pushing against said supplemental track to urge said gripping members closest to said drum against the edge of said supplemental track closest to the drum whereby said second pivot pin is placed in longitudinally parallel alignment with the longitudinal axis of the drum, said urging being with a force sufficiently small to allow the easy translational sliding of said pinch roller carriage along said supplemental track;



(h) second bias means operably connected between said pinch roller carriage and said pivot arm for urging said pinch roller down against the surface of the drum and said gripping members into pinching engagement with said supplemental track with sufficient force to prevent translational movement of said pinch roller carriage; and,

(i) bias release means for selectively holding said pinch roller off said drum and releasing said pinching engagement against the force of said second bias means to allow translational movement of said pinch roller carriage and thereby the position of said pinch roller along the length of the drum.

4,567,492

PAPER TRANSPORT DEVICE FOR A RECORDER

Bengt Skafvenstedt, Stockholm, and Sture Ahlgren, Vaellingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,168

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138517

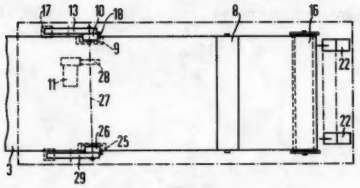
Int. Cl.[4] G01D *15/26;* **B41J** *11/42;* **B65H** *25/26*

U.S. Cl. 346—136 **6 Claims**

1. A paper transport device combined with a recorder means, said transport device having a means for supporting clean paper, a means for forwardly guiding the paper past said recording means, and a motor-driven means for moving said paper:

p0 at least two driven rollers each mounted on an axle, said axle being driven by said motor and said drive rollers being disposed a distance from one another at right angles relative to a direction of paper forward feed,

means for mounting said drive rollers on said axle permitting said drive rollers to freely rotate at a same or faster speed than said axle in the same direction of rotation as said axle for automatically preventing skewed transport of paper



through said device, and locking said rollers when attempted to be rotated in an opposite direction; and

two idler rollers mounted adjacent to and respectively associated with each drive roller for forming a paper-receiving nip.

4,567,493

LIQUID JET RECORDING HEAD

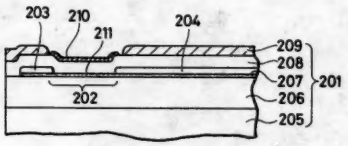
Masami Ikeda, Machida; Hiroto Matsuda, Ebina; Makoto Shibata, and Hiroto Takahashi, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 598,974

Claims priority, application Japan, Apr. 20, 1983, 58-69585

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **15 Claims**



1. A liquid jet recording head comprising:

a liquid discharge portion including an orifice for discharging a liquid to form a flying liquid droplet and a liquid flow path communicating with said orifice including a heat applying portion for applying thermal energy to the liquid to form the liquid droplet;

an electro-thermal transducer including at least a pair of opposing electrodes electrically connected to a heat generating resistive layer formed on a base and a heat generating portion formed between said electrodes;

a first upper protection layer of an inorganic insulative material and a second upper protection layer of an organic material overlying at least a portion of said first upper protection layer, said layer being provided on at least said electrodes; and

said first upper protection layer and a third upper protection layer of an inorganic material different from the inorganic material of said first upper protection layer provided on at least said heat generating portion.

4,567,494

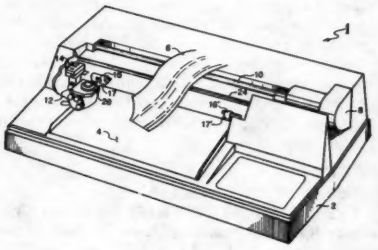
NOZZLE CLEANING, PRIMING AND CAPPING APPARATUS FOR THERMAL INK JET PRINTERS

Bret K. Taylor, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 29, 1984, Ser. No. 626,000

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. Ink jet printing apparatus comprising:

(A) a printhead including an ink-ejecting orifice plate, said printhead being adapted to move in a predetermined direction;

(B) a suction cup assembly;

(C) a carriage member for said cup assembly;

(D) a pantograph-like linkage assembly connected to and supporting said carriage member whereby upon engagement of said carriage member by said printhead, said carriage member is moved by said printhead in said predetermined direction and in a direction toward said printhead by said linkage assembly to bring said cup assembly into contact with said orifice plate;

(E) and vacuum means connected to said cup assembly for sucking ink from said orifice plate into said cup assembly.

4,567,495

RECORD HEAD CLEANING DEVICE FOR IMAGE RECORDING APPARATUS

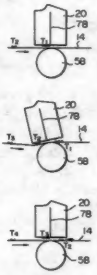
Kazuhiro Yuasa, Zama, and Kenya Komada, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,463

Claims priority, application Japan, Mar. 30, 1982, 57-51710; Apr. 2, 1982, 57-55169

Int. Cl.⁴ G02D *15/06*

U.S. Cl. 346—153.1 **6 Claims**



1. A device for cleaning a record head having a stylus means in a transfer type image recording apparatus which includes a rotating recording medium having an endless recording surface and means for developing and cleaning the recording surface, comprising:

a drive source for generating a driving force;

a transmission mechanism for transforming the driving force into a pivotal motion and applying the pivotal motion to the record head;

means for positioning the stylus means of the record head relative to the recording surface of the recording medium; and

operation control means for controlling the timing for the transmission of the pivotal motion to the record head such that an angle of the stylus means relative to the recording medium is periodically changed during intervals between recording cycles of the recording apparatus with no substantial toner layer between the stylus means and the surface of the recording medium thereby residual toner particles from the recording medium stuck on the record head are removed from the record head solely the rotating recording medium.

4,567,496

PRESSURE-SENSITIVE RECORDING SHEETS

Yasuhiro Ogata, and Masakazu Maekawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1983, Ser. No. 505,510

Claims priority, application Japan, Jun. 18, 1982, 57-105161

Int. Cl.[4] B41M *5/1, 5/22*

U.S. Cl. 346—200 12 Claims

1. A pressure-sensitive recording sheet comprising a paper substrate which contains therein a succinic acid derivative having an alkenyl or alkyl group, or a salt thereof, said group containing from 4 to 18 carbon atoms and a layer containing an electron-donating color former and/or an electron-accepting color developer, wherein the succinic acid derivative or salt thereof is present in an amount within the range of 0.01 to 10% based on the weight of the paper substrate and wherein said succinic acid derivative or salt thereof is added to a pulp slurry and fixed to the pulp with a fixer, whereafter said paper substrate is formed.

4,567,497

HEAT-SENSITIVE RECORDING PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 5, 1985, Ser. No. 708,456

Claims priority, application Japan, Mar. 5, 1984, 59-41735

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—200 6 Claims

1. A heat-sensitive recording paper comprising a paper support and a heat-sensitive color-forming layer on the paper support, wherein the paper support contains a cationic softening agent.

4,567,498

RECORD MATERIAL

Kenneth J. Shanton, Beaconsfield, England, assignor to The Wiggins Teape Group Limited, Hampshire, England

Filed Jun. 15, 1984, Ser. No. 621,195

Claims priority, application United Kingdom, Jun. 15, 1983, 8316232

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—216 7 Claims

1. Pressure sensitive record material in which the colour forming reaction is produced from a substantially colourless chromogenic material capable of acquiring a positive charge to produce its coloured form and an oxime colour developer capable of engendering the acquisition of a positive charge by the chromogenic material, the chromogenic material and the colour developer being isolated from each other by a pressure sensitive barrier.

4,567,499

MEMORY DEVICE

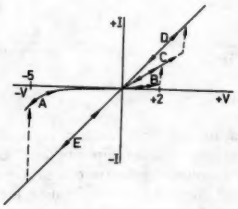
Peter J. Hockley, Swindon, and Michael J. Thwaites, Hook, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed May 12, 1983, Ser. No. 494,009

Claims priority, application United Kingdom, May 15, 1982, 8214204

Int. Cl.[4] H01L *45/00*

U.S. Cl. 357—2 6 Claims



1. A memory device comprising an electrically conducting substrate and layers of i and p and/or n type amorphous or microcrystalline semiconducting material which have been conditioned by the application of a voltage sufficiently large to cause the structure to be permanently modified to reduce the electrical resistance of the layers wherein no p and n layers are adjacent in the device.

4,567,500

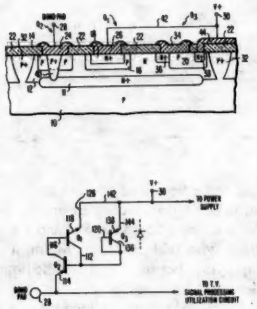
SEMICONDUCTOR STRUCTURE FOR PROTECTING INTEGRATED CIRCUIT DEVICES

Leslie R. Avery, Flemington, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 326,219, Dec. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 230,357, Jan. 30, 1981, abandoned. This application Aug. 27, 1984, Ser. No. 644,452

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 10 Claims



1. In an semiconductor structure for protecting an integrated utilization circuit having a substrate, a bond pad, the utilization circuit including a signal terminal connected to the bond pad, a single semiconductor layer of a first conductivity type disposed on the substrate, the semiconductor layer having a surface, a first semiconductor region of a second conductivity type disposed in PN junction forming relation with the semiconductor layer, a second semiconductor region of the first conductivity type disposed in PN junction forming relation within the first semiconductor region; the improvement comprising:

a third semiconductor region of the second conductivity type disposed in PN junction forming relation with the semiconductor layer;

a fourth semiconductor region of the first conductivity type disposed in the semiconductor layer, the fourth semiconductor region being spaced adjacent to the first semiconductor region;

a fifth semiconductor region of the same conductivity type as the semiconductor layer and positioned solely beneath the first and third semiconductor regions and disposed between the semiconductor layer and the substrate, the fifth semiconductor region having a lower resistivity than that of the semiconductor layer;

first conductive means for connecting the bond pad to the third semiconductor region;

a power supply terminal; and

second conductive means for connecting the second semiconductor region to the fourth semiconductor region and to the power supply terminal.

4,567,501

RESISTOR STRUCTURE IN INTEGRATED INJECTION LOGIC

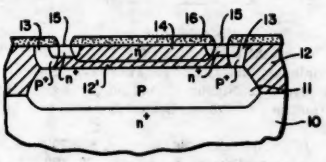
Takeshi Fukuda, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 179,936, Aug. 20, 1980, abandoned. This application Dec. 22, 1983, Ser. No. 563,887

Claims priority, application Japan, Aug. 27, 1979, 54-108938

Int. Cl.[4] H01L *27/04*

U.S. Cl. 357—51 **2 Claims**



1. A semiconductor device including an integrated injection logic device and a resistor element comprising:

a semiconductor substrate of a first conductivity type;

a semiconductor layer of said first conductivity type formed on said semiconductor substrate;

a buried layer of a second conductivity type opposite to said first conductivity type formed between said semiconductor substrate and said semiconductor layer;

a ring shaped diffused region of said second conductivity type reaching to said buried layer and surrounding an area of said semiconductor layer on said buried layer;

a resistor semiconductor region of said first conductivity type formed in said area;

a pair of diffused regions of the first conductivity type formed in said area and contacting said resistor region; and

means for electrically connecting said pair of diffused regions to wirings of said semiconductor device;

said integrated injection logic device including a pair of spaced apart regions of said second conductivity type and being located in said semiconductor layer and spaced from said substrate, and an additional region of said first conductivity type positioned within one of said pair of spaced apart regions.

4,567,502

PLANAR TYPE SEMICONDUCTOR DEVICE WITH A HIGH BREAKDOWN VOLTAGE

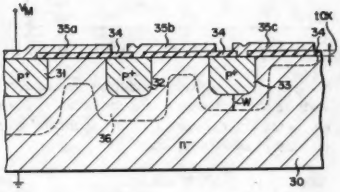
Akio Nakagawa, Amherst, Mass.; Tadashi Utagawa, Yokohama, and Tsuneo Tsukakoshi, Zushi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

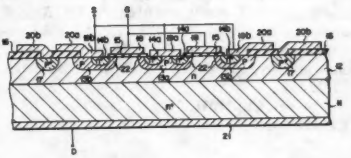
Continuation of Ser. No. 335,345, Dec. 29, 1981. This application Mar. 14, 1984, Ser. No. 587,879

Claims priority, application Japan, Mar. 28, 1981, 56-45773

Int. Cl.[4] H01L *29/40*

U.S. Cl. 357—53 **2 Claims**





1. A planar type semiconductor device having a high breakdown voltage, including:

a diffusion region of a second conductivity type formed in a selected surface portion of a semiconductor layer of a first conductivity type;

at least a first guard ring region of the second conductivity type formed in another surface portion of said semiconductor layer surrounding said diffusion region at a given distance;

an insulating film covering a given portion of the surface of said semiconductor layer;

a first conductive layer provided on that portion of said insulating film formed on the surface of said semiconductor layer between said diffusion region and said guard ring region, said first conductive layer kept at a potential equal to that of said diffusion region and covering the entire surface of that portion of said insulating film which is between said diffusion region and said guard ring region; and

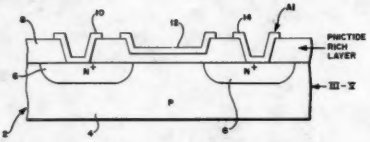
a second conductive layer provided on that portion of said insulating film formed on the surface of said semiconductor layer surrounding the first guard ring region, said second conductive layer kept at a potential equal to that of said first guard ring region and away from said diffusion region extending outwardly.

4,567,503

MIS DEVICE EMPLOYING ELEMENTAL PNICTIDE OR POLYPHOSPHIDE INSULATING LAYERS

Diego Olego, Croton-on-Hudson; David G. Brock, Mt. Kisco; John A. Baumann, Ossining, all of N.Y., and William E. Spicer, Stanford, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 29, 1983, Ser. No. 509,210
Int. Cl.[4] H01L *29/34, 29/78, 29/20, 29/161*
U.S. Cl. 357—54 16 Claims



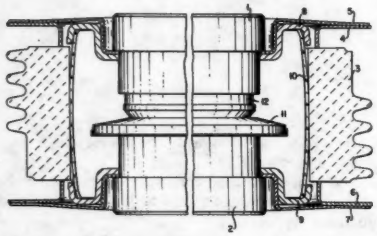
4. A metal insulating semiconductor device comprising:
a substrate formed from a semiconductor material, and
an insulating layer formed from an elemental pniotide material on said substrate.

4,567,504

SEMICONDUCTOR COMPONENT WITH A DISC-SHAPED CASE

Werner Egerbacher, Munich, and Dieter Wunderlich, Geiselbullach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 141,255, Apr. 18, 1980, abandoned.
This application Mar. 14, 1984, Ser. No. 589,392
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915862
Int. Cl.[4] H01L *21/447, 21/603, 23/10*
U.S. Cl. 357—79 5 Claims



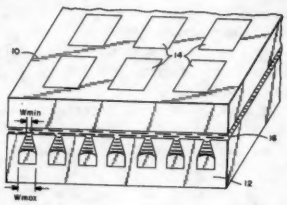
1. Semiconductor component with a case having an interior, comprising a ceramic ring having an inner surface and end faces, two metal discs having peripheries, metal ring members connecting said metal discs to said ceramic ring, a semiconductor body disposed in the case between said metal discs, additional metal ring members each being respectively fastened to the periphery of one of said metal discs in the case, said additional metal ring member having outer edges and sides facing toward the interior of the case, said side of at least one of said additional metal ring members having an indentation formed therein defining a concave surface facing toward the interior of the case, said outer edge of said at least one additional metal ring member overlapping an end face of said ceramic ring, and at least one electrically and thermally insulating one-piece foil having a high energy of evaporation disposed between the simiconductor body and said ceramic ring covering said inner surface of said ceramic ring, overlapping said additional metal ring members and extending into said indentation.

4,567,505

HEAT SINK AND METHOD OF ATTACHING HEAT SINK TO A SEMICONDUCTOR INTEGRATED CIRCUIT AND THE LIKE

Roger F. Pease; David B. Tuckerman, both of Stanford, and Richard M. Swanson, Los Altos, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 27, 1983, Ser. No. 546,158
Int. Cl.[4] H01L *23/36*
U.S. Cl. 357—81 12 Claims



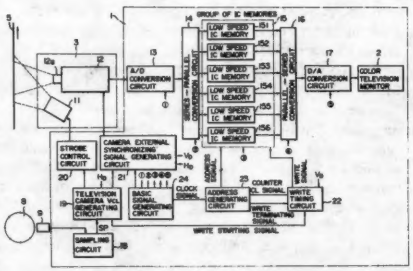
1. A combination comprising
a first body having a major generally planar surface,
a second body having a major generally planar surface, said surface of said second body having a first plurality of microscopic grooves therein, each groove having reentrant surfaces and providing a liquid reservoir, and
a liquid material which partially fills and wets the groove surfaces and said major surfaces,
said major surface of said first body being in abutment with said major surface of said second body with said fluid material being therebetween and partially filling said grooves and thereby maintaining said major surfaces in abutment.

4,567,506

MONITORING APPARATUS FOR COLOR PRINTING

Morimasa Shinoda, and Takamasa Takahashi, both of Tokyo, Japan, assignors to Nippon Univac Supply Kaisha, Ltd. and Limited Company of Shinoda Sekkei Jimusho, both of Tokyo, Japan

Filed Apr. 10, 1984, Ser. No. 598,790
Claims priority, application Japan, Apr. 28, 1983, 58-74088
Int. Cl.[4] H04N *7/18, 11/04*
U.S. Cl. 358—11 1 Claim



1. A monitoring apparatus for color printing, comprising:
a stroboscope for illuminating printed matter moving at a high speed with extremely short pulse-like strobe light;
a color television camera for receiving an image formed by light reflected from or transmitted through said printed matter, said light being from said stroboscope;

an A/D conversion circuit connected to said camera for converting a composite video signal from said camera resulting from a lag of a projected image formed on a camera tube of said color television camera, said composite video signal including a vertical synchronizing signal and a video signal;

a serial to parallel conversion circuit connected to said A/D conversion circuit for converting a serial digital output signal from said A/D conversion circuit into a parallel digital signal;

an IC memory connected to said serial to parallel conversion circuit for storing signals of both a first field portion and a second field portion of said composite video signal;

an address control circuit connected to said IC memory for causing said IC memory to repeatedly output video signals for said field portions stored in said IC memory in an order of: one—a vertical synchronizing signal of said first field, two—a video signal of said first field, three—a vertical synchronizing signal of said second field, and four—a video signal of said first field, and

a color television monitor connected to an output of a D/A conversion circuit which is connected to an output of a parallel to serial conversion circuit which is connected to an output of said IC memory for displaying a signal output from said IC memory by said address control circuit as a stationary image of said printed matter, said signal output being transmitted through said parallel to serial conversion circuit and said D/A conversion circuit.

4,567,507

COLOR TELEVISION SIGNAL CONVERSION DEVICE

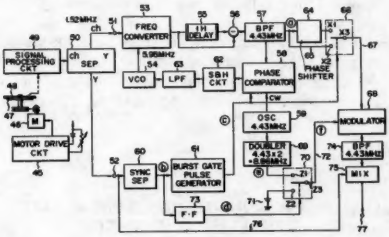
Tetsuo Kusakabe; Tetsuro Sakai, and Kazuhiko Honda, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 17, 1983, Ser. No. 476,403

Claims priority, application Japan, Mar. 19, 1982, 57-42693

Int. Cl.⁴ H04M *9/42*

U.S. Cl. 358—11 **9 Claims**



1. Color television converting apparatus comprising:

first signal generating means for generating a color television signal including at least a luminance signal having a line synchronization signal and a first carrier chrominance signal whose frequency has been converted into a lower one than a standard carrier frequency and on which two color signal components (B-Y) and (R-Y) are quadrature-modulated;

chrominance/luminance signal separator means, connected to said first signal generating means, for receiving said color television signal and separating it into said luminance signal and said first carrier chrominance signal;

luminance signal processing means for separating said line synchronization signal from said luminance signal and producing from said line synchronization signal a burst gate pulse signal and a switching control signal whose frequency is half the frequency of said line synchronization signal;

controllable oscillator means for providing a predetermined local frequency signal;

frequency converting means for converting said first carrier chrominance signal into a second carrier chrominance signal having said standard carrier frequency by mixing said predetermined local frequency signal with said first carrier chrominance signal;

burst signal processing means including 45 degrees phase shift means having an input, and first switching means having a first signal terminal connected via said phase shift means to said frequency converting means, and a second signal terminal connected between said frequency converting means and said phase shift means input, said burst signal processing means being controlled by said burst gate signal in such a manner that during a color burst period, only a color burst signal contained in said second carrier chrominance signal is phase-shifted by 45 degrees by said phase shift means so as to provide a third carrier chrominance signal in which a color burst signal is delayed with respect to an axis of said signal component (B-Y);

second signal generating means for producing a carrier signal whose frequency is twice as high as said standard carrier frequency;

modulator means for modulating said third carrier chrominance signal with said carrier signal;

second switching means response to said switching control signal for selectively supplying said second carrier signal to said modulator means for every other line.

4,567,508

TWO-CHANNEL COMPATIBLE TELEVISION TRANSMISSION SYSTEM FOR WIDE PICTURE FORMATS

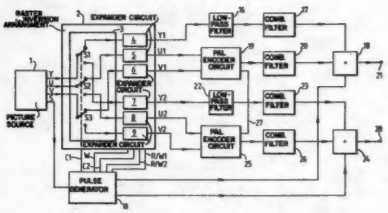
Michael G. Hulyer, Crawley Down, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1983, Ser. No. 552,540

Claims priority, application United Kingdom, Dec. 22, 1982, 8236369

Int. Cl.⁴ H04N *11/20, 11/06*

U.S. Cl. 358—11 **12 Claims**



1. A method for simultaneously transmitting television signals depicting the same scene, for standard and wide picture formats of, respectively, a standard aspect ratio and a wider than standard aspect ratio, in which both picture formats have the same height, said method comprising the steps: converting a wide-band television signal, which represents the full width of the wide picture format and has n lines per picture, into a first narrower-band television signal, which also represents the full width of the wide picture format and has m lines per picture, where m is substantially ½n and both said wide-band and said first narrower-band television signals have the same field and picture rates, in which said conversion comprises deriving respective adjacent lines of a field of said first narrower-band television signal from respective alternate lines in a field of said wide-band television signal, characterized in that said method further comprises converting said wide-band television signal into a second narrower-band television signal representing the width of the standard picture format and having the same number of lines and the field and picture rates as said first narrower-band television signal, in which said conversion comprises deriving respective adjacent lines of a correspond-

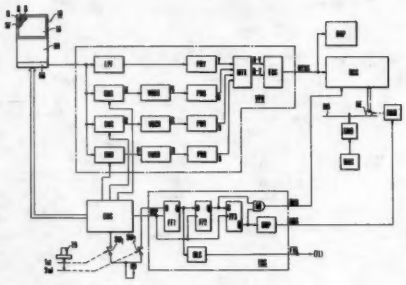
ing field of said second narrower-band television signal from the respective intervening lines of the field of said wide-band television signal, and transmitting said first and second narrower-band television signals by way of respective first and second transmission paths, wherein the transmissions from said first and second transmission paths may be received together and a wide-band television signal having n lines per picture reconstituted from said first and second narrower-band television signals for reproduction as a wide picture format television display or the transmission from the second transmission path may be received alone for reproduction as a television display of standard picture format and normal quality as herein defined.

4,567,509

TELEVISION CAMERA WITH COLOR BALANCE

Makoto Takayama, Kanagawa; Tomotaka Muramoto, Tokyo, and Akimasa Nishimura, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 467,348, Feb. 17, 1983, Pat. No. 4,499,487. This application Sep. 18, 1984, Ser. No. 652,171
Claims priority, application Japan, Feb. 26, 1982, 57-31228
Int. Cl.[4] H04N 9/73
U.S. Cl. 358—29 10 Claims



1. A color video camera for use with a detachable electronic flash device which is arranged to produce an indication signal indicating the completion of preparation for flash emission, said camera comprising:

(A) color image pick-up means for producing an electrical signal corresponding to a received color image;

(B) circuit means for receiving the electrical signal and for producing a color video signal including color signal components;

(C) color balance adjusting means for adjusting color balance of the color signal components in the color video signal;

(D) receptacle means for receiving the flash device; and

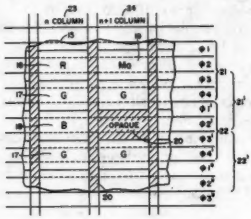
(E) control means responsive to the indication signal produced by the flash device for causing said adjusting means to adjust the color balance of the color signal components in the color video signal to a condition suited for said image pick-up means under illumination by the flash emitted from the flash device.

4,567,510

SOLID STATE COLOR IMAGING APPARATUS

Nobuyoshi Tanaka; Seiji Hashimoto, and Tetsuro Kuwayama, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 679,096, Dec. 6, 1984, abandoned, which is a continuation of Ser. No. 526,897, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 233,096, Feb. 10, 1981, Pat. No. 4,437,112. This application May 20, 1985, Ser. No. 736,410
Claims priority, application Japan, Feb. 15, 1980, 55-17968; Apr. 18, 1980, 55-51224; Apr. 21, 1980, 55-53302; Apr. 21, 1980, 55-53309
Int. Cl.[4] H04N 9/07
U.S. Cl. 358—44 37 Claims



1. An imaging apparatus comprising:

imaging means for converting an optical image into an output electrical signal, said imaging means including a solid-state image sensor and having a predetermined saturation level;

detecting means for detecting an excess of at least one portion of an output electric signal level of said imaging means above a predetermined level related to the saturation and for producing an output representing the detection; and

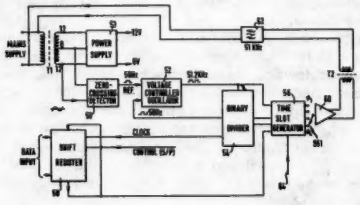
limit means for limiting one part of the output electric signal of said imaging means in response to the output of said detecting means, said limit means limiting the output electric signal of said imaging means to a predetermined fixed level.

4,567,511

TRANSMITTING AND STORING DATA RELATING TO TELEVISION VIEWING

Peter E. Smith, Reading, and Raymond Laxton, Maidenhead, both of United Kingdom, assignors to AGB Research PLC, London, England

Filed May 24, 1984, Ser. No. 614,320
Claims priority, application United Kingdom, May 25, 1983, 8314468
Int. Cl.[4] H04H 9/00
U.S. Cl. 358—84 10 Claims



1. An arrangement for transmitting data from a plurality of units for monitoring the channels to which a plurality of televi-

sions are tuned to a plurality of respective data storage devices, the arrangement comprising:

means for receiving the data from the monitoring units; and

means for transmitting the data, as multi-bit digital words, to the respective data storage devices by way of a domestic mains wiring system having a voltage supply which fluctuates about a baseline at mains supply frequency, the transmission means having

means for defining a plurality of time slots in each half cycle of the voltage supply and referenced to baseline crossings of the voltage supply,

means for generating a carrier signal for the unit,

means for gating the carrier signal "on" and "off" according to the bit values of the digital word,

means for selecting one of the plurality of time slots for the transmission of the carrier signal when gated "on", whereby, the time slots are selectable to correspond uniquely to the respective monitoring units and

means for transmitting the carrier signal, when gated "on", onto the writing system in the selected time slot.

4,567,512

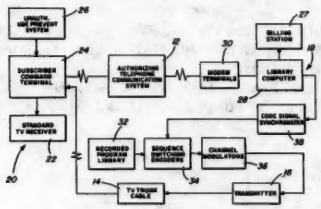
RECORDED PROGRAM COMMUNICATION SYSTEM

Nicholas F. Abraham, Cape Coral, Fla., assignor to World Video Library, Inc., Tex.

Continuation-in-part of Ser. No. 409,566, Aug. 19, 1982, Pat. No. 4,521,806, which is a continuation-in-part of Ser. No. 383,604, Jun. 1, 1982. This application Sep. 28, 1983, Ser. No. 536,660

Int. Cl.[3] H04N 7/18

U.S. Cl. 358—86 10 Claims



1. In a communication system including a program library having a broadcast transmitter, a plurality of modulators connected to the transmitter, program record player means connected to said modulators for transmission of a plurality of discrete recordings of broadcast signals during periodically repeated time segments and computer means for generating information relating to identification of said discrete recordings and the time segments associated therewith; telephone means linked to the computer means of the program library through a plurality of terminals, a plurality of subscriber command units connected to the telephone means at associated subscriber stations, and standard broadcast signal receivers at said subscriber stations connected to the command units, each of said command units having selection data entry means for dialing from said terminals through the telephone means to initially establish a telephone link with the computer means through which the computer generated information is transmitted and memory means for storing the computer generated information transmitted through the telephone link established by the dialing means, broadcast means connected to the transmitter of the program library for transmission of the broadcast signals and converter means in each of the command units at the subscriber stations for coupling the broadcast means to the standard receiver under control of the computer generated information stored in the memory means.

4,567,513

THREE DIMENSIONAL TELEVISION SYSTEM

Donald J. Imsand, 308 Jonquil Ave., Fort Walton Beach, Fla. 32548

Filed Nov. 2, 1983, Ser. No. 547,897

Int. Cl.[4] H04N 13/02

U.S. Cl. 358—92 30 Claims

1. A method of displaying a stereo pair of images to present a single, three dimensional, sharply focused, flicker-free image to human visual perception comprising the steps of:

(a) positioning a pair of video cameras in stereo relation to each other to view a scene,

(b) displaying the video signal from first one camera,

(c) displaying the video signal from the second camera in registration with the display of the first signal, in binocular relationship to the first signal and for approximately the same period as the first signal,

(d) switching between display of the first and second signals at a rate between 3 and 25 of each image per second, and

(e) monitoring the light level of the scene and increasing the rate of switching between display of the first and second signals responsive to higher light levels.

4,567,514

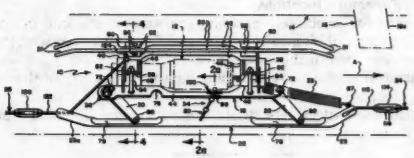
CAMERA CARRYING CONDUIT INSPECTION SLED

William C. Morgan, and Richard A. Wagner, Sr., both of Amherst, N.Y., assignors to Wag-Mor Corporation, Amherst, N.Y.

Filed Feb. 27, 1984, Ser. No. 583,700

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—100 8 Claims



1. A conduit inspection sled including cage means for carrying a camera or the like, peripherally spaced upper and lower support means mounted on the upper and lower sides respectively of said cage means, and cable means connected to said sled for transporting the same along the conduit, wherein the improvement comprises: link means pivotally connecting said cage means and lower support means for relative movement toward and away from each other into retracted and extended sled positions respectively; and resilient means connecting and normally biasing said cage means and lower support means into said extended sled position, wherein said lower support means movably contact the inner periphery of the conduit and thereby normally center the camera or the like substantially along the central longitudinal axis of the conduit; said resilient means also permitting said relative movement into said retracted sled position, wherein the sled is allowed to clear an obstacle within the conduit; one of said cage means and lower support means being provided with stop means engageable with retainer means on the other of said cage means and lower support means, for limiting said relative movement to said extended position; one of said cage means and link means being

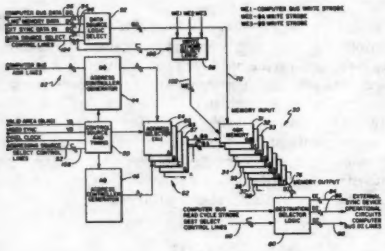
provided with latch means removably engagable with keeper means on the other of said cage means and link means for locking said sled in fully retracted position; and said cable means including a cable connected to and extending in one direction from said lower support means, and a cable connected to and extending in the opposite direction from said cage means, whereby pulling on one of said cables while tensioning the other of said cables collapses said sled into said fully retracted position, in order to facilitate retrieval of said sled by reversely transporting the same past an obstruction already cleared.

4,567,515

MULTIPLE IMAGE GENERATION AND ANALYSIS SYSTEM

Peter M. Schumacher, Great Falls, Mont., assignor to Measuronics Corporation, Charlotte, N.C.

Filed Apr. 20, 1983, Ser. No. 486,767
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—107 **37 Claims**



1. A multiple image generation and analysis system for use with an analog video signal in raster format comprising:

means for storing data comprising a plurality of addressable memrory locations, each memory location having a plurality of bit locations so that each memory location is capable of storing a plurality of data bits;

input means for providing data to be stored in the plurality of memory locations;

means for selectively entering the data in any one of the plurality of bit locations during and synchronized with the raster scan of the video signal;

means for selectively accessing data stored in any of the bit locations; and

means for selectively displaying data from any of the bit locations.

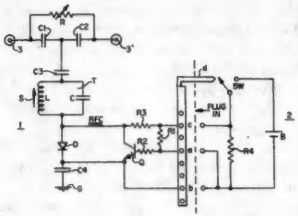
4,567,516

SPECIAL PROGRAM DECODING OF SCRAMBLED SUBSCRIPTION TELEVISION TRANSMISSIONS

George Scherer, East Brunswick; Walter Joswick, Metuchen, and Isaac S. Blonder, Morganville, all of N.J., assignors to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Aug. 30, 1982, Ser. No. 412,780
Int. Cl.[4] H04N 7/16; H04K 1/00
U.S. Cl. 358—114 **21 Claims**

1. Decoding apparatus for subscription scrambled television programs of specialized nature and limited period of time reception, having, in combination, a base unit comprising passive electronic circuit means adapted, when energized, to decode the scrambling of a received television program transmission; a disposable energizing unit comprising a limited life voltage source connected in circuit with normally open switching means and dissipation means for bleeding the voltage of the voltage source when the switching means is closed; means for plugging the energizing unit into the base unit; means operable upon such plug-in for closing the switching means and connecting the voltage source to the base unit electronic circuit to energize the same and permit the decoding of the scrambled television program for the duration of the life of the voltage source; the dissipation means being adjusted so that upon the plug-in of the energizing unit, the voltage source



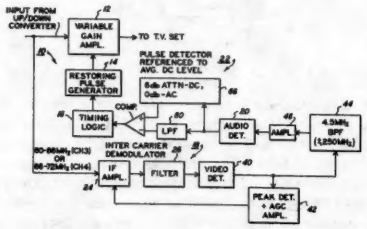
is sufficiently dissipated to insure insufficient life to energize the base unit electronic circuit after the limited period of time of the specialized television program.

4,567,517

DESCRAMBLER FOR SYNC-SUPPRESSED TV SIGNALS

Joseph G. Mobley, Dunwoody, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Feb. 15, 1983, Ser. No. 466,699
Int. Cl.[4] H04N 7/16; H04B 1/04
U.S. Cl. 358—120 **16 Claims**



1. A descrambler for a sync suppressed TV signal having a picture carrier and a sound signal carrier which is transmitted with timing pulses as amplitude modulation of said sound signal, which comprises means operating upon said TV signal when it is above its baseband frequency range for intercarrier demodulating said sound carrier against said picture carrier to produce a video baseband signal, including said sound signal, means for detecting said timing pulses in said baseband sound signal, said detecting means including means for amplitude demodulating said sound signal to produce a signal representing the envelope thereof and translating said envelope into first and second signals wherein said pulses are present and absent respectively, and means for outputting said timing pulses when said first signal is a predetermined ratio of said second signal, and means responsive to said detected timing pulses for restoring said sync pulses in said TV signal thereby descrambling said TV signal.

4,567,518
SYSTEM FOR DECODING AND DISPLAYING ENCODED TELEVISION PICTURES

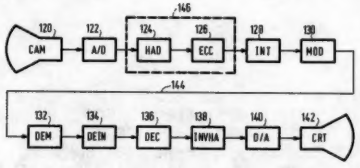
Leonardus M. H. E. Driessen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 451,685, Dec. 20, 1982. This application Jun. 27, 1985, Ser. No. 749,682

Claims priority, application Netherlands, Dec. 23, 1981, 8105799

Int. Cl.⁴ H04N 7/12

U.S. Cl. 358—133 **5 Claims**



1. In a system receiving encoded data for reconstructing a television picture constituted by a plurality of subpictures, said encoded data comprising subpicture data transformed by transformation functions each having a series of a coefficient bits including a most significant bit, said transformation functions having associated frequencies including a lowest frequency, said series of coefficients being encoded in subsets of k bits of said a coefficient bits into code words comprising larger groups of n bits by a predetermined code having a first minimum Hamming distance of four for allowing at least single error correction, double error detection within said k bits, said code further having a second minimum Hamming distance of five for allowing double error correction within an error protected subset of at least two of said k bits, and wherein said k bits contain at least one bit constituting said most significant bit of said coefficient associated with said transformation function having said lowest frequency, decoding apparatus comprising

means for receiving each of said code words and generating a syndrome word indicative of errors therein on a first output and a plurality of the most significant code bits of said code word on a second output;

error indication means having an input connected to said first output and a first error indication output for furnishing a plurality of primary error indication bits indicative of errors detected in a corresponding plurality of said most significant code bits;

logic means having a first input connected to said first error indication output and a second input connected to said second output of said receiving and generating means for adding said primary error indication bits to said most significant code bits thereby creating a plurality of repaired code bits; and

means connected to said logic means for generating reconstructed data words in response to said repaired code bits.

4,567,519
PROCESS FOR THE ADAPTATIVE CODING AND THE DECODING OF A TELEVISION PICTURE AND DEVICES FOR PERFORMING THIS PROCESS

Christian Richard, Noyal sur Vilaine, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 20, 1984, Ser. No. 591,479

Claims priority, application France, Mar. 22, 1983, 83 04671

Int. Cl.⁴ H04N 7/12

U.S. Cl. 358—135 **6 Claims**

1. A process for the adaptative coding and the decoding of a television picture, each point in said picture being represented by its brightness value and in which coding consists of:

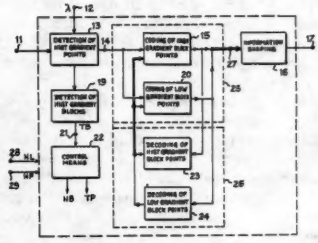
regrouping the points of the picture in blocks of N_P consecutive points of the same line, N_P being a fixed integer,

detecting the points, called high brightness gradient points, whose brightness values differ at least by a value λ from that of one of the adjacent points on the same line or on the preceding line;

coding each block, called high brightness gradient blocks, containing at least one high gradient point, by calculating the difference between the brightness value of each point and a value obtained by coding and then decoding the brightness value of the immediately preceding point and by quantifying this difference according to a first non-linear quantification scale,

coding each block, called low brightness gradient block, containing no high gradient point, by calculating for at least one point of the block the difference between the brightness value of this point and a value obtained by coding and then decoding the brightness value of a so-called reference point from among the points which have previously been coded, followed by the quantification of the value of this difference according to a second non-linear quantification scale, such that the quantification error is smaller for the low values than for the high values of the difference,

distinguishing by a logic indicator, the coded data corresponding to the high gradient blocks on the one hand and those corresponding to the low gradient blocks on the other,



and wherein decoding consists of:

identifying the coded data corresponding to the high gradient blocks on the one hand and those corresponding to the low gradient blocks on the other, on the basis of the value of the logic indicator,

decoding each high gradient block by determining a decoded value of the brightness of each of its points by a quantification of its coded value in accordance with a reverse scale compared with the first quantification scale used for coding, and by an addition of the thus obtained value and the decoded value of the brightness of the immediately preceding point,

decoding each low gradient block by determining a decoded value of the brightness of each point having been coded and belonging to said block by a quantification of its coded value, in accordance with a reverse scale compared with the second quantification scale used for coding, and by an addition of the thus obtained value and the decoded value of the brightness of the corresponding reference point, and by determining a decoded value of the brightness of each point not having been coded and belonging to said block, by an interpolation as a function of the decoded values of the brightness of adjacent points on the same line and on the preceding line.

4,567,520
TELEVISION CIRCUIT ARRANGEMENT FOR DETERMINING IN A VIDEO SIGNAL FRAME PERIODS COMPRISING TWO FIELD PERIODS

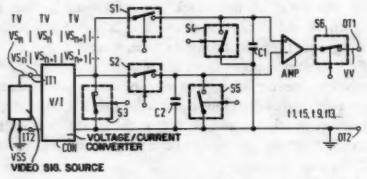
Leendert J. van de Polder, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1984, Ser. No. 578,915

Claims priority, application Netherlands, Feb. 17, 1983, 8300592

Int. Cl.⁴ H04N *17/00*

U.S. Cl. 358—139 **4 Claims**



1. A television circuit arrangement for determining in a video signal, frame periods comprising two field periods, whereby a video signal comprising a picture signal is present at an input terminal and originates from a signal source for supplying a picture signal repeated in cycles of two successive field periods and with a possible change of picture content, characterized in that the television circuit arrangement is provided with a switching circuit, a first and a second signal integration circuit and a signal comparison circuit connected thereto, the first and the second signal integration circuits being coupled via the switching circuit alternately every other field period to the signal source, during at least a part of a field period, after an operation of resetting to a reference value, while further, before one of the said resetting operations takes place, the signal comparison circuit is operative for supplying a voltage depending upon the comparison of the two signal integrations to an output terminal of the television circuit arrangement.

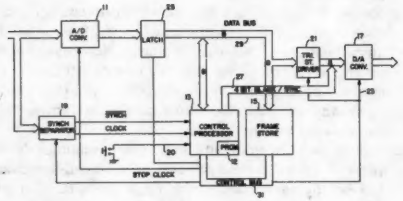
4,567,521
PROCESSOR CONTROLLED DIGITAL VIDEO SYNC GENERATION

Mario de la Guardia, and Ming-Luh Kao, both of Miami, Fla., assignors to Racal Data Communications Inc., Miami, Fla.

Filed Jun. 28, 1983, Ser. No. 509,173

Int. Cl.⁴ H04N *5/06*

U.S. Cl. 358—150 **5 Claims**



3. In a digital video processor, an apparatus for generating an output sync pulse train comprising:

a digital-to-analog converter means; and

means for controlling said converter means to produce said output sync pulse train; wherein said controlling means comprises:

storage means for storing transition times corresponding to transitions between black and blacker-than-black levels in a desired sync signal,

counting means for counting time intervals,

comparing means for comparing the counted intervals to said stored times in order to detect a match between one of said counted time intervals and one of said stored transition times; and

means for producing control signals to said digital-to-analog converter means upon detection of said match between one of said counted time intervals and one of said stored transition times.

4,567,522
LINE SYNCHRONIZING CIRCUIT FOR A PICTURE DISPLAY DEVICE

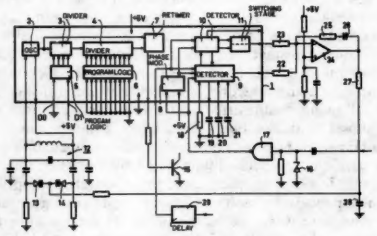
Martinus V. C. Stroomer, and Frederick M. Boekhorst, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 405,125, Aug. 4, 1982, abandoned. This application Jan. 16, 1985, Ser. No. 691,780

Claims priority, application Netherlands, Aug. 6, 1981, 8103705

Int. Cl.⁴ H04N *7/00*

U.S. Cl. 358—158 **7 Claims**



1. In a video system having a picture display device and a horizontal deflection circuit,

apparatus for creating a circuit synchronizing a locally generated line frequency signal to a received line synchronizing signal by modification of a high frequency synthesizing circuit constituted by an integrated circuit having stabilized reference oscillator means for generating a signal having a frequency higher than line frequency, controllable divider means connected to said stabilized reference oscillator means, a retiming circuit connected to said divider means, said frequency synthesizing circuit further having phase detector means, said apparatus comprising

means connected to said divider means for maintaining said divider means at a predetermined constant divider ratio;

means connecting said retiming means to said horizontal deflection circuit of said picture display device, whereby said horizontal deflection circuit generates said locally generated line frequency signal;

means for applying said locally generated line frequency signal and said received line synchronizing signal to said phase detector means;

filter means connected to said phase detector means for furnishing a filtered control signal indicative of the phase difference between said received line synchronizing signal and said locally generated line frequency signal;

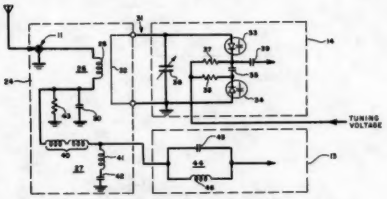
and means for applying said filtered control signal to said oscillator means, whereby said locally generated line frequency signal is synchronized to said received line synchronization signal.

4,567,523

TELEVISION RECEIVER INPUT CIRCUIT

David R. Hiday, Dandridge, and Charles G. Larsen, Knoxville, both of Tenn., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,226
Int. Cl.⁴ H04N 5/44; H03H 7/38
U.S. Cl. 358—191.1 10 Claims



7. An input circuit for use in a television receiver of the type having a VHF tuner section, a UHF tuner section and a single receiver input terminal, for separating the VHF and UHF components of a combined VHF-UHF signal applied to said receiver input terminal and for applying the VHF and UHF components to the VHF and UHF input of respective VHF and UHF tuner circuits, comprising:

a constant-k low-pass filter section having an input electrically connected to said receiver input terminal and including at least one inductor element;

means for electromagnetically coupling said at least one inductor element to said UHF input of said UHF tuner circuit; and

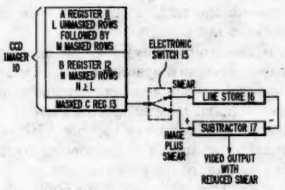
a low pass m-derived filter section having its input electrically connected to the output of said constant-k filter section and having its output connected to said VHF input of said VHF tuner circuit.

4,567,524

SMEAR REDUCTION IN CCD IMAGERS USING EMPTY WELL CLOCKING

Peter A. Levine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 407,926, Aug. 13, 1982, which is a continuation-in-part of Ser. No. 393,733, Jun. 30, 1982, abandoned. This application Nov. 21, 1983, Ser. No. 554,085
Int. Cl.⁴ H04N 3/14
U.S. Cl. 358—213 17 Claims



1. A method for reducing transfer smear in video output signal originating from a CCD imager of field transfer type, which method comprises the steps of:

continuing to clock the image or A register of the CCD imager after its entire contents at the time that field transfer clocking began, including samples of image charge, are clocked from the A register to the field store or B register during field retrace time, for introducing a line of empty well samples into said A register from a non-existent or phantom row register and advancing them across said A register to accumulate a line of smear samples;

storing, for at least the ensuing field trace time, a line of smear charge samples clocked from the A register during said continued clocking, and

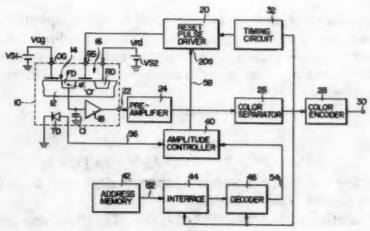
using the stored smear charge samples to reduce the smear in samples of image charge taken from the B register during that ensuing field trace time.

4,567,525

CCD PICTURE ELEMENT DEFECT COMPENSATING APPARATUS

Yukio Endo; Nozomu Harada, and Okio Yoshida, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 15, 1984, Ser. No. 661,050
Claims priority, application Japan, Oct. 18, 1983, 58-195074
Int. Cl.⁴ H04N 3/14
U.S. Cl. 358—213 12 Claims



1. A solid-state image sensing apparatus comprising:

(a) solid-state image sensor means for generating signal charges in response to incident image light thereto to produce an electrical CCD output signal at its output terminal, said CCD output signal including an image signal component corresponding to the signal charges and a reset pulse signal component arising due to the mixing of a reset pulse signal supplied to said image sensor means into the CCD output signal; and

(b) picture element compensating means for, when said image sensor means contains a defective picture element, detecting in an analog manner an increment of a signal level corresponding to a dark current generated at the defective picture element, and for compensating the picture element defect in such a way as to reduce, by the increment of said detected signal level, the mixed reset pulse component contained in the CCD output signal produced from said defective picture element, whereby the output signal from said image sensor means is substantially equivalent to that of a normal image sensor.

4,567,526

SERVO CONTROL CIRCUIT MODULE FOR USE IN A TELEVISION CAMERA

Kazumichi Tsuchiya, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

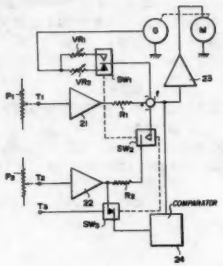
Filed Oct. 15, 1982, Ser. No. 434,636
Claims priority, application Japan, Oct. 17, 1981, 56-166052
Int. Cl.⁴ H04N 5/232; G03B 1/00
U.S. Cl. 358—227 13 Claims

1. A servo control circuit module for use in a television camera having a zoom lens and a focussing lens, which comprises:

servo control circuit means operable in either a speed control mode or a position control mode for controlling the respective speed or position of one of said lenses in response to speed or position signals, respectively;

said servo control circuit means having several elements in

common which are operative in both said speed control mode and said position control mode, said common elements including a servo motor for driving said one of said lenses, a servo drive amplifier whose output drives said



servo motor, and feedback circuit means coupled between said servo motor and said servo drive amplifier; and

mode selection means connected to said servo circuit means for selecting said speed control mode or said position control mode.

4,567,527

IMAGE READING APPARATUS

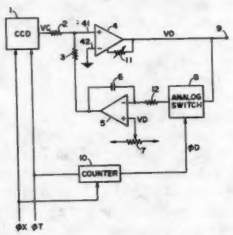
Yoshikazu Yokomizo, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 197,637, Oct. 16, 1980, abandoned. This application Nov. 16, 1984, Ser. No. 672,160

Claims priority, application Japan, Oct. 20, 1979, 54-135442

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—282 **6 Claims**



1. An image reading apparatus, comprising:

means for generating clock pulses;

a solid-state imaging device connected to be driven by clock pulses, generated by said generating means, to read an original image and to produce an output representative thereof, said imaging device including a linear array of photoreceptor cells;

means for amplifying the output of said imaging device;

a feedback circuit for correcting the output of said imaging device, said feedback circuit including means for comparing the output of said amplifying means, when said imaging device is driven to read a reference image density, with a predetermined reference value and for producing a correction signal in accordance with the comparison, and means for applying a signal correction to said output of said imaging device at the input of said amplifying means in accordance with said correction signal;

means for counting said clock pulses generated by said generating means;

switching means provided in said feedback circuit and connected to said counting means to operate at a timing determined by counting of said pulses by said counting means to close said feedback circuit for the production of said correction signal when said imaging device reads said reference image density; and

means for retaining said signal correction for a predetermined time.

4,567,528

DOCUMENT SCANNERS

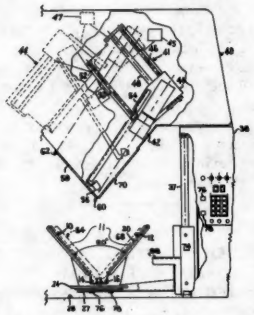
Hugh Wilman, 76 Mount Grace Rd., Potters Bar, Hertfordshire, and James Brotton, 1 Moss Dr., Haslingfield, Cambridgeshire, both of England

Filed Nov. 4, 1983, Ser. No. 549,197

Claims priority, application United Kingdom, Nov. 5, 1982, 8231679

Int. Cl.[4] H04N *1/04, 1/02*

U.S. Cl. 358—285 **12 Claims**



1. A document scanner for scanning the opened pages of a book comprises:

(i) a housing having a downfacing wedge section with windows in two adjoining faces thereof which can be positioned with the ridge of the wedge in the gutter of a partially opened book,

(ii) at least one lamp means within the housing for illuminating pages positioned against the two windows,

(iii) at least one scanning camera hereinafter referred to as a scanner adapted to scan in turn each of the two pages which are visible through the said windows, to generate electrical video signals corresponding to the information carried by each of the pages in turn,

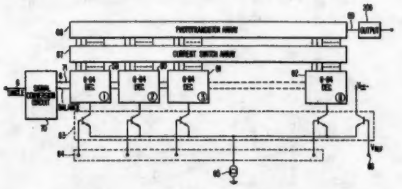
(iv) a V-shaped trough in which the book will rest, the angle of the trough corresponding to the included angle of the wedge shaped housing and aligned therewith so that a partially opened book resting in the trough can be sandwiched between the windowed faces of the wedge and the sides of the trough, and

(v) means for effecting relative movement between the housing and the trough to permit movement apart to a first position which permits a book to be positioned in or removed from the trough and pages to be turned and movement together to a second position at which the book is sandwiched therebetween for scanning.

4,567,529
IMAGE SENSOR

Kazufumi Yamaguchi, Yao, and Takahiko Murata, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1984, Ser. No. 617,566
Claims priority, application Japan, Oct. 26, 1983, 58-200294; Jan. 6, 1984, 59-976
Int. Cl.⁴ H04N *1/02, 1/10, 3/14*
U.S. Cl. 358—294 **20 Claims**



1. A self scanning type image sensor for converting an optical signal to an electric signal comprising:

a photo transistor array composed of a plurality of phototransistors for converting an optical signal to an electric current signal;

a first current switch array composed of a plurality of current switches which are connected with said plurality of phototransistors respectively;

a plurality of decoder circuits each for selecting one of said plurality of current switches of said first current switch array according to a first control signal;

a second current switch array composed of a plurality of current switches for selecting one of said plurality of decoder circuits according to a second control signal;

a current source circuit for supplying a current to said selected one of said plurality of decoder circuits through selected one of said plurality of current switches of said second current switch array;

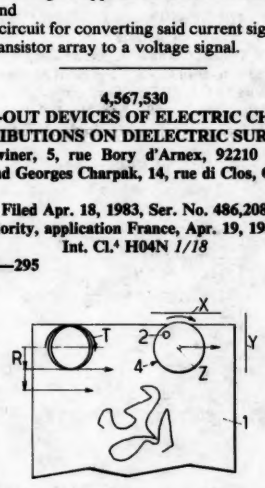
a drive circuit for producing said first control signal applied to each of said plurality of decoder circuits and said second control signal applied to said second current switch array; and

an output circuit for converting said current signal from said phototransistor array to a voltage signal.

4,567,530
READ-OUT DEVICES OF ELECTRIC CHARGE DISTRIBUTIONS ON DIELECTRIC SURFACES

Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint Cloud, France, and Georges Charpak, 14, rue di Clos, Geneve, Switzerland

Filed Apr. 18, 1983, Ser. No. 486,208
Claims priority, application France, Apr. 19, 1982, 82 06675
Int. Cl.⁴ H04N *1/18*
U.S. Cl. 358—295 **13 Claims**

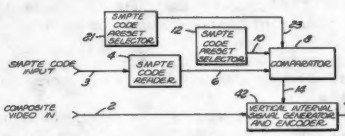


1. A read-out device for providing read-out of electric charges carried by a dielectric sheet, said device comprising a probe, means for providing relative displacement between said probe and sheet, said displacement taking place parallel to the sheet with said probe in close proximity to said sheet, and an electronic circuit for producing at each instant an electrical signal s the amplitude of which is related to the charge induced at this instant on the probe by the charges to be read-out which are carried by the sheet over a region facing the probe, said device further including a rotating head supporting, at one of the axial ends thereof the probe in out of center relationship with respect to the rotation axis Z of said head; means for rotating said head around the rotation axis thereof at a high speed; means for displacing the head parallel to the sheet; means for determining at each instant the angular coordinate a of the probe around the Z axis thereof, as well as the coordinates x and y of this axis in two directions X and Y; and means for transmitting at each instant the values s, a, x and y obtained at this instant, computing and visualization means for receiving the transmitted values s, a, x and y obtained during scanning of the surface of the sheet by the probe and for producing a visible image each point of which, as defined by the coordinates a, x and y, has an intensity dependent on the amplitude of the corresponding signal s.

4,567,531
VERTICAL INTERVAL SIGNAL ENCODING UNDER SMPTE CONTROL

George K. Tabata, Wilmington, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Jul. 26, 1982, Ser. No. 401,587
Int. Cl.⁴ H04N *5/92*
U.S. Cl. 358—335 **26 Claims**



1. A method for vertical interval signal encoding of a composite video program signal having at least a video program portion with sequential fields separated by vertical intervals, said program signal having associated therewith sequential field related identification code signals, said method comprising the steps of:

generating a desired field related identification code at which encoding of said composite video program signal is to commence;

generating continuously recurring vertical interval code signals, signal-compatible with said program signal and synchronous therewith, at predetermined intervals corresponding to like intervals between groups of fields of said program signal;

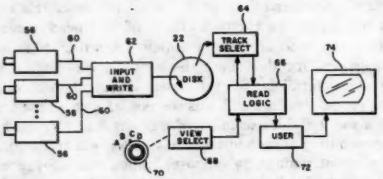
comparing said field related identification code signals associated with said program signal with the selected desired field related identification code; and

upon the occurence of a match of identification codes in said comparing step, signal-mixing said composite video program signal and said vertical interval code signals in timed relationship so as to insert said vertical interval code signals in time corresponding vertical intervals of said program signal.

4,567,532
SELECTABLE VIEW VIDEO RECORD/PLAYBACK SYSTEM

Ralph H. Baer, Manchester, N.H., and David Allen, Scituate, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 16, 1983, Ser. No. 532,874
Int. Cl.[4] H04N 5/76
U.S. Cl. 358—342 3 Claims



1. A video record and playback system comprising:

(a) a plurality of video cameras positioned to view a particular scene from different vantage points for simultaneously receiving images and generating electrical video signals at respective outputs thereof at standard television frame rates representing the received images from the multiple vantage points;

(b) a recording medium having a plurality of recording tracks thereon for recording video signals;

(c) interleaving writing means connected to respective ones of said outputs of said cameras for receiving and writing said electrical video signals onto said recording tracks in a pre-established interleaved addressing pattern so that each addressable "track" is comprised of a plurality of "subtracks" equal to the number of vantage points which are respective ones of said recording tracks with one said subtrack for each said video signal from each said camera;

(d) reading means for subsequently reading the recorded signal on ones of said subtracks corresponding to a particular one of said vantage points sequentially from respective ones of said tracks and for generating an output video signal at standard television frame rates from said read signal;

(e) video display means operably connected to receive said output video signal for displaying a visual representation thereof; and,

(f) vantage point changing means for selectively changing said ones of said subtracks being read by said reading means to enable viewing of another of said vantage points.

4,567,533
APPARATUS FOR READING A DISK-SHAPED OPTICAL RECORD CARRIER

Gerardus J. Assink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

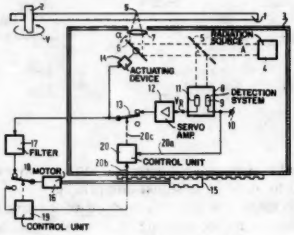
Filed Dec. 7, 1983, Ser. No. 559,065
Claims priority, application Netherlands, Aug. 31, 1983, 8303029
Int. Cl.[4] H04N 5/781
U.S. Cl. 358—342 4 Claims

1. An apparatus for reading a disk-shaped record carrier containing a video signal recorded in generally parallel tracks, said apparatus comprising:

an optical read unit, said read unit including means for projecting a read beam of radiation onto said record carrier so as to read the video signal recorded in said tracks, a deflection element for varying the position of the said read beam on said record carrier in a direction transverse to the direction of said tracks, said deflection element being movable in two opposite directions relative to a center position in response to a control signal, means for deriving the video signal from said read beam after cooperation with said record carrier, and means for measuring radial deviation of said read beam relative to a desired track, said measuring means producing said control signal in dependence on said radial deviation measured thereby,

means for radially moving said read unit relative to said record carrier,

a servo control loop for controlling the radial position of said read beam on said record carrier, said control loop including said deflection element and said measuring means and further comprising switching means for rendering said servo control inoperative during controlled time intervals and means for moving said deflection element at least towards said center position during said controlled time intervals, and

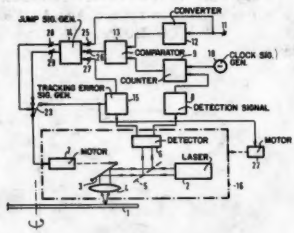


means for controlling said switching means, said controlling means including means, coupled to said deriving means, for detecting field pulses or synchronizing signals in the video signal read from said record carrier, which synchronizing signals are time correlated to said pulses, and means for generating, in response to a given field pulse or synchronizing signal detected by said detecting means, a periodic signal which controls said switching means so as to alternately render said servo control loop operative and inoperative in a predetermined relationship with said given pulse or synchronizing signal in response to which said periodic signal is generated.

4,567,534
APPARATUS FOR READING A DISC-SHAPED RECORD CARRIER

Robertus W. C. Groen; Cornelis A. M. de Jonge; Lawrence M. Schwartz, and Johannes C. van Lier, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1983, Ser. No. 559,064
Claims priority, application Netherlands, Jan. 9, 1983, 8303046
Int. Cl.[4] H04N 5/85
U.S. Cl. 358—342 3 Claims



1. Apparatus for reading a disc-shaped record carrier in which video signals are recorded in substantially spiral tracks in such a way that corresponding picture elements of consecutive pictures are situated at substantially the same circumferen-

tial position on said record carrier, an address code being contained in at least one of two fields of each video picture in said video signals at a predetermined position in a field-blanking interval following a field-synchronizing pulse, said apparatus comprising:

means for projecting a light beam onto the record carrier so as to form a landing spot thereon for reading the video signals recorded in the tracks, said light beam being modulated by the record carrier upon relative movement therebetween,

means for recovering the video signal from said modulated light,

means for determining the radial position of said landing spot relative to a track being read, said position determining means generating a radial tracking error signal indicative of the position of said landing spot relative to said track being read during read out of the video signal,

means for moving said beam relative to said record carrier in a direction transverse to the track direction, said beam moving means being responsive to said radial error tracking signal so as to maintain said landing spot on said track being read,

first means, coupled to said video signal recovering means, for generating a first signal which gives a continuous indication of the duration of a time period up to a reference point in the field-blanking interval which precedes the next address code in the video signal recorded in the track being read,

means for receiving a jump command signal which is indicative of the number of tracks to be jumped,

second means for generating, in response to said jump command signal, a second signal indicative of anticipated duration of said jump to be performed in response to said command signal,

means for comparing said first and second signals, said comparing means generating a start signal when said duration of said time period up to said reference point is substantially equal to said anticipated duration of said jump, and

third means for generating, in response to said start signal and said command signal, a control signal which is applied to said beam moving means and causes said beam moving means to shift said beam over a radial distance corresponding to the number of tracks to be jumped.

4,567,535

RECORDING AND/OR REPRODUCING APPARATUS

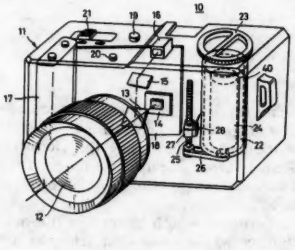
Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,442

Claims priority, application Japan, Oct. 27, 1981, 56-171868; Aug. 8, 1982, 57-137742

Int. Cl.⁴ G11B *5/004, 19/00*

U.S. Cl. 360—87 **21 Claims**



1. A recording and/or reproducing apparatus for recording and/or reproducing an information signal on and/or from a recording medium which is user-interchangeably loadable into said recording and/or reproducing apparatus, said recording medium having a truncated cone shape and comprising a hollow, conical part having an outer peripheral surface and opposite ends, said hollow part being open at one of said ends, and a recording surface formed on said peripheral surface of said hollow part, said hollow, conical part having only slight taper so as to be almost cylindrical, said recording and/or reproducing apparatus comprising:

a rotational motor including a rotary shaft and magnetic coupling means on said rotary shaft to rotatably couple said recording medium to said shaft, said motor being mounted so as to be substantially surrounded by said hollow part of said recording medium when said recording medium is loaded into said recording and/or reproducing apparatus, said magnetic coupling means supporting and magnetically coupling the other end of the loaded recording medium to the rotary shaft to allow said recording medium to be detached from the drive of said rotational motor;

a magnetic recording and/or reproducing transducer for recording and/or reproducing an information signal on and/or from said recording surface of said recording medium with the latter rotationally driven by said magnetic coupling means of said motor; and

feeding means for feeding said recording and/or reproducing transducer along said recording surface of said recording medium.

4,567,536

ADAPTER FOR A MINIATURE TYPE TAPE CASSETTE

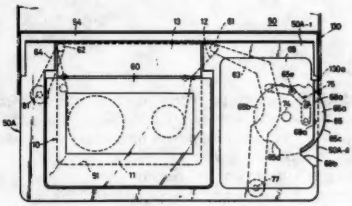
Eiichi Tsuchiya, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 18, 1983, Ser. No. 495,808

Claims priority, application Japan, May 31, 1982, 57-80452[U]; May 31, 1982, 57-80453[U]

Int. Cl.⁴ G11B *15/66*

U.S. Cl. 360—94 **8 Claims**



1. An adapter for a miniature type tape cassette having an external form and size smaller than those of a standard type tape cassette, said miniature type tape cassette being used with a recording and/or reproducing apparatus of a type different from a standard type recording and/or reproducing apparatus primarily designed for carrying out recording and/or reproduction with said standard type tape cassette, said standard type recording and/or reproducing apparatus comprising an inserting part into which said standard type tape cassette or said adapter is inserted, said miniature type tape cassette comprising a cassette case smaller than said standard type tape cassette, and a tape accommodated within said cassette case and forming a tape path along a front of said cassette case when said miniature type tape cassette is not in use, said adapter comprising:

an adapter case having an external form and size substantially identical to those of said standard type tape cassette;

an accommodating part for accommodating said miniature type tape cassette; and

tape draw-out means provided within said adapter case, for drawing out the tape from said miniature type tape cassette so as to form a predetermined tape path within said adapter case;

said tape draw-out means comprising tape draw-out mem-

bers relatively entering on an inner side of the tape path along the front of said cassette case when accommodating said miniature type tape cassette within said accommodating part, and a manipulation part for operating said tape draw-out members so as to form said predetermined tape path within said adapter,

said manipulation part projecting outside said adapter case to such an extent that said manipulation part hits said inserting part of said standard type recording and/or reproducing apparatus and prevents insertion of said adapter into said inserting part before and during manipulation of said manipulation part, and receding within said adapter case to permit insertion of said adapter through said inserting part after manipulation of said manipulation part is completed.

4,567,537

TRANSISTOR-CONTROLLED-LOAD, SHORT-CIRCUIT-PROTECTED CURRENT-SUPPLY CIRCUIT

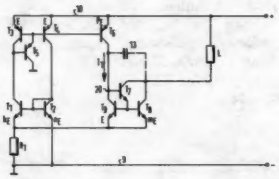
Bernd Kalkhof, Reutlingen, and Karl Nagel, Gomaringen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,295

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238880

Int. Cl.⁴ H02H *7/20*

U.S. Cl. 361—18 **8 Claims**



1. Load short circuit protected current supply circuit, adapted for connection to a load (L) and being supplied with electrical power from a pair of power terminals (+,−) having

an output transistor (T7, T8);

a dropping or current control resistor (R1),

the emitter-collector path of the output transistor, and of the dropping resistor being connected in a series circuit which, in turn, is serially connected to the load (L) and to the power terminals;

and a current supply circuit (T1–T6) coupled to the base of the output transistor (T7, T8) to control current flow therethrough independently of supply voltage, said current supply circuit being connected to include said dropping resistor (R1) for controlled current flow to the base of the output transistor as a function of, and as determined by, the value of said resistor;

wherein the output transistor comprises a transistor pair including a first transistor (T8) and a second transistor (T7) both transistors of the pair being of the same conductivity type (npn); and

a third transistor (T9) having the same conductivity type as the transistors (T8, T7) of said transistor pair,

the emitter-base path of the third transistor being connected in parallel to the emitter-base path of the first transistor (T8), the collector of the third transistor being connected to the base of the second transistor,

said three transistors (T7, T8, T9) forming a current mirror circuit, the input to the current mirror circuit being formed by the base of the second transistor (T7) and the output of the current mirror circuit being formed by the commonly connected collectors of the first and second transistors (T8, T7).

4,567,538

ALTERNATING CURRENT LIMITING APPARATUS

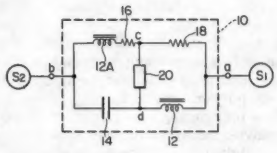
Satomi Arimoto, Nishinomiya; Hiroyuki Hirakawa, Minoo, and Hiroshi Maekawa, Suita, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,528

Claims priority, application Japan, Feb. 2, 1983, 58-16584

Int. Cl.⁴ H02H *9/02*

U.S. Cl. 361—58 **6 Claims**



1. An alternating current limiting apparatus comprising:

a first series circuit connected between different kinds of power system lines and formed of first and second components;

a second series circuit connected in parallel with said first series circuit and formed of a third component and two resistors serially connected to each other; and,

a closing device inserted across the interconnection of said first and second components and the interconnection of both of said resistors;

said closing device being normally maintained in its open state to form a series resonance circuit with said first and second components, while, upon the occurrence of a fault of either of said power systems, said closing device is closed to form a parallel resonance circuit with said first and third components.

4,567,539

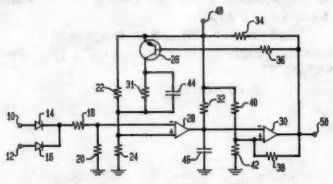
POWER INTERRUPTION AND BROWNOUT DETECTOR

Howard Sinberg, Coral Springs, Fla., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Mar. 23, 1984, Ser. No. 592,681

Int. Cl.⁴ H02H *3/24*

U.S. Cl. 361—92 **5 Claims**



1. A power interruption and brownout detector for an alternating current voltage source, comprising:

(a) rectifier means for converting the alternating current voltage source output to pulsating direct current voltage;

(b) a direct current voltage source which provides first and second reference voltages;

(c) a first comparator which compares the output of the rectification means with the first reference voltage, the first comparator being of the type for providing two output states, a first state providing a grounding condition and a second state for providing no output voltage contribution;

(d) a voltage storage device associated with the first comparator, the device being charged by the direct current voltage source when the output of the rectifier means is less

than the first reference voltage and discharged during the first state of the first comparator;

(e) a second comparator which compares the voltage storage device voltage with the second reference voltage; and

(f) means, associated with the second comparator, for indicating a power interruption or brownout condition when the voltage storage device voltage is greater than the second reference voltage.

4,567,540

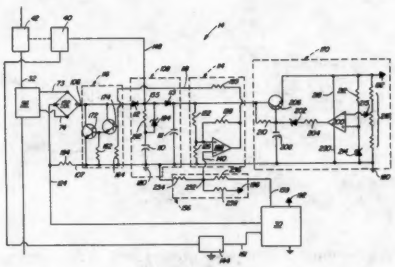
POWER SUPPLY FOR A CIRCUIT INTERRUPTER

Joseph W. Ruta, Elmhurst, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Jun. 22, 1983, Ser. No. 506,944

Int. Cl.⁴ H02H *3/08*

U.S. Cl. 361—93 **19 Claims**



1. A power supply for a circuit interrupter in an alternating current line, the circuit interrupter having a trip signal generator for generating a trip signal when the current in the line satisfies a predetermined condition, said power supply comprising:

current-producing means for producing output current proportional to the current in the line;

energy storage means for storing energy derived from said output current and for providing a source of energy to operate the circuit interrupter in response to generation of a trip signal by the trip signal generator;

reference signal means responsive to said trip signal for providing a reference signal, said reference signal being in a first state when no trip signal is generated and in a second state when a trip signal is generated;

control signal means responsive to said reference signal and to the amount of energy stored by said energy storage means for generating a control signal, wherein when said reference signal is in the first state, said control signal is in a first state when the amount of stored energy is less than a first predetermined level and in a second state when the amount of stored energy exceeds a second predetermined level, and wherein when said reference signal is in the second state, said control signal is in the first state when the amount of stored energy is less than a third predetermined level and in the second state when the amount of stored energy exceeds a fourth predetermined level; and

switch means responsive to said control signal, said switch means being in the off state when said control signal is in the first state and in the on state when said control signal is in the second state, said switch means diverting said output current away from said energy storage means when in the on state and allowing output current to flow to said energy storage means when on the off state, thereby maintaining the energy stored in said energy storage means between said first and second predetermined levels when said reference signal is in the first state, and maintaining the energy stored in said energy storage means between said third and fourth predetermined levels when said reference signal is in the second state.

4,567,541

ELECTRIC POWER SOURCE FOR USE IN ELECTROSTATIC PRECIPITATOR

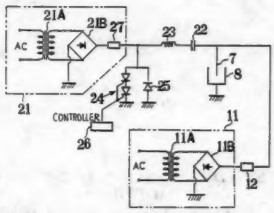
Hiroshi Terai, Hiratsuka, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,664

Claims priority, application Japan, Feb. 7, 1983, 58-18578; May 20, 1983, 58-89790

Int. Cl.⁴ H01T *23/00*

U.S. Cl. 361—235 **20 Claims**



1. An electric power source for use in an electrostatic precipitator having a discharge electrode, comprising a first high voltage DC source having an output terminal adapted to be connected to the discharge electrode of the electrostatic precipitator, an inductor having one end connected through a coupling capacitor to said output terminal, a controlled rectifier having its anode connected to the other end of said inductor and its cathode connected to ground, a diode connected in reversed parallel to said controlled rectifier, a second high voltage DC source having a high output impedance and connected to said inductor, and a controller which can supply a trigger pulse to the gate of said controlled rectifier, wherein said controller is an independently operated pulse generator, wherein said second high voltage DC source is connected to said other end of said inductor, and wherein said second high voltage DC source includes a power transformer having a primary winding connected to an AC power source and a secondary winding of a high impedance connected through a rectifier bridge to said inductor.

4,567,542

MULTILAYER CERAMIC SUBSTRATE WITH INTERLAYERED CAPACITOR

Yuzo Shimada; Kazuaki Utsumi; Teruyuki Ikeda, and Masanori Suzuki, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

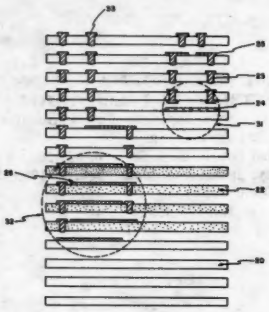
Filed Apr. 23, 1984, Ser. No. 603,109

Int. Cl.⁴ H01G *4/10;* H01L *19/00*

U.S. Cl. 361—321 **7 Claims**

5. A hybrid ceramic structure comprising a plurality of glass-ceramic insulator layers sandwiching at least one dielectric layer with interposed circuit patterns, wherein each glass-ceramic insulator layer has a composition consisting essentially of oxides in the ranges of: 40 through 60 percent by weight of aluminum oxide, 1 through 40 percent by weight of lead oxide, 1 through 30 percent by weight of boron oxide, 2 through 40 percent be weight of silicon dioxide, zero through 2.5 percent by weight of at least one oxide selected from oxides of chemical elements in Group I of the periodic table, 0.01 through 25 percent by weight of at least one oxide selected from oxides of

chemical elements in Group II of the periodic table, and 0.01 through 10 percent by weight of at least one oxide selected



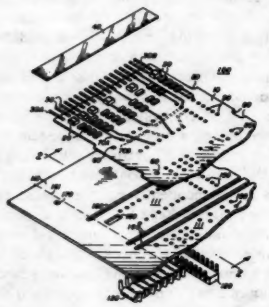
from oxides of chemical elements in Group IV of the periodic table except for carbon, silicon, and lead.

4,567,543

DOUBLE-SIDED FLEXIBLE ELECTRONIC CIRCUIT MODULE

Jay J. Miniet, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 15, 1983, Ser. No. 466,466
Int. Cl.[4] H05K *1/00*
U.S. Cl. 361—398 **7 Claims**



1. A double-sided flexible electronic circuit module having a plurality of leadless components and components having leads comprising:

a flexible circuit board having co-planar conductive circuitry affixed to both first and second sides;

first means for electrically connecting certain conductors of said circuitry on said first side with certain conductors of said circuitry on said second side;

non-conductive adhesive disposed between said leadless components and said first side, said leadless components being located within a first predetermined area on said flexible circuit board;

an insulative carrier member mounted to said second side in a second predetermined area on said flexible circuit board contiguously supporting said components with leads, said second predetermined area spaced apart from and not overlapping said first predetermined area, said carrier having a first set of holes receiving said leads and said flexible circuit board having a second set of holes in alignment with said first set of holes with said leads passing through said carrier member to said first side of said flexible circuit board;

solder connecting said leadless components and components with leads to selected conductors on said first side of said flexible circuit board; and

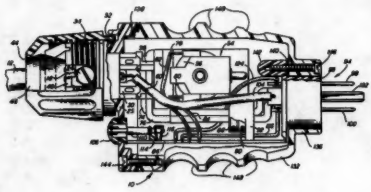
second means for providing electrical connections to said conductors.

4,567,544

PLUG-IN GROUND FAULT CIRCUIT INTERRUPTER MODULE

DeHertburn N. Ronemus, North Syracuse, and Victor M. Tice, Manlius, both of N.Y., assignors to Pass & Seymour, Inc., Solvay, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,154
Int. Cl.[4] H05K *5/06*
U.S. Cl. 361—399 **6 Claims**



1. A substantially waterproof ground fault circuit interrupter module for attachment to the wires of a line cord extending from an electrical load, said module including plug blades for insertion in an electrical receptacle to connect said load to a power source, said module comprising:

(a) a hollow, one-piece body member enclosed on four sides and having openings at opposite ends;

(b) a plug subassembly including said blades and a solid plug member through which said blades extend in sealed engagement;

(c) a relay subassembly including a coil and movable contacts;

(d) a circuit board subassembly including ground fault responsive means;

(e) a cover subassembly including a wall member with a circular collar extending from one side thereof;

(f) means interconnecting said plug, relay, circuit board and cover subassemblies for mutual support to form a complete assembly;

(g) said assembly being inserted into said body member with said plug and wall members in sealing engagement with said openings at opposite ends of said body member, whereby said relay and circuit board subassemblies are entirely enclosed in a first, watertight compartment defined by said body, plug and wall members with said collar and blades extending outwardly in opposite directions therefrom;

(h) a cap member releasably engageable with said collar in covering relation to form a second compartment, said cap member having an opening therein for passage of a line cord;

(i) terminal means extending in sealing engagement through the portion of said wall member surrounded by said collar between said first and second compartments for attachment thereto of the wires of a line cord within said second compartment; and

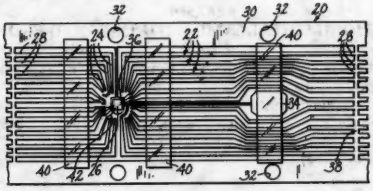
(j) a resilient grommet having an opening through which a line cord passes, said grommet being positioned within said second compartment in sealing engagement with said cap member opening to render said second compartment watertight when said module is attached to a line cord.

4,567,545

INTEGRATED CIRCUIT MODULE AND METHOD OF MAKING SAME

Rollin W. Mettler, Jr., 4 Tumblebrook Ct., Cheshire, Conn. 06410

Filed May 18, 1983, Ser. No. 495,693
Int. Cl.[4] H05K *1/18, 7/02;* H01J *5/00*
U.S. Cl. 361—401 30 Claims



1. An inetgrated circuit module adapted to connect an IC chip to a printed circuit board edge connector, comprising:

a nonconductive substantially planar circuit board substrate having first and second surfaces and a contact edge for connection to the printed circuit board edge connector;

a conductive lead frame having a first set of leads laminated to the first surface of the substrate and a second set of leads wrapped around an edge of the substrate and laminated to the second surface of the substrate, said first and second set of leads having inner tips for connection to the IC chip and outer contact ends for contacting the printed circuit board edge connector;

wherein the contact ends of the first set of leads are laminated to the first surface of the substrate in spaced relation along the contact edge, and the contact ends of the second set of leads are laminated to the second surface of the substrate in spaced relation long the contact edge; and

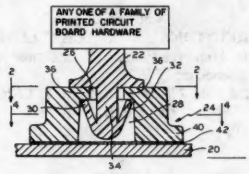
whereby the contact ends of the first and second set of leads are presented along the contact edge for contacting the printed circuit board edge connector.

4,567,546

ANCHOR BASE MOUNTING BLOCK

John C. Zeller, Schaumburg, and Peter M. Wells, Jr., Sycamore, both of Ill., assignors to All States Plastic Mfg. Co., Inc., Chicago, Ill.

Filed Nov. 8, 1982, Ser. No. 440,250
Int. Cl.[4] H05K *7/04*
U.S. Cl. 361—420 14 Claims



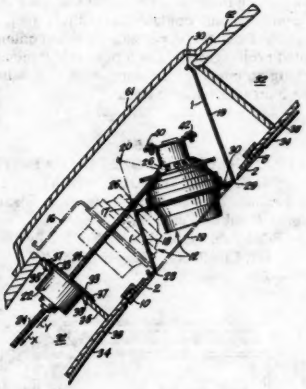
1. A plastic mounting block which receives and captures an anchor base of a type used for mounting electronic components on a metal chassis said anchor base having a somewhat arrowhead shape with resilient interferring protrusion barbs extending therefrom, said mounting block comprising a block having upper and lower surfaces with side walls therebetween to form a cavity, said mounting block being slightly larger than said anchor base and said cavity being shaped and dimensioned to receive and contain only said anchor base, a single anchor base mounting hole in said upper surface, said hole being centrally located over and communicating with said cavity, said hole being formed in the top of said block in the size and shape required to receive and capture said anchor base while deflecting said barbs inwardly, whereby said hole and cavity comprise means receiving and capturing said anchor base, a flange formed by the top of said cavity and the upper surface of the block through which said hole passes, said flange capturing the barbs when they relax from the deflected position, said anchor base being free to rotate over at least a substantial arc when in the cavity, and attachment means on the lower surface of said mounting block for securing it to said chassis, whereby said mounting block enables said anchor base to be mounted on said chassis without requiring a mounting hole in said chassis.

4,567,547

AIR AND LIGHT UTILITY ASSEMBLIES

Enrique Alie, Brooklyn; Arthur H. Gilmore, New York, both of N.Y., and Henry J. Mack, Jr., Levittown, Pa., assignors to Falcon Jet Corporation, Teterboro, N.J.

Filed Sep. 28, 1984, Ser. No. 655,709
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—154 8 Claims



1. A utility assembly, comprising:

a housing having an opening therein;

a utility mechanism to provide light or air functions;

a substantially Z-shaped support member pivotally supported at least partially within said housing, said utility mechanism being mounted in the cross member extending between the substantially parallel members of the Z-shaped member, one of said substantially parallel members mating with said opening to substantially close the opening whereby when the opening is closed the utility mechanism is enclosed within the housing; and

linear movement means cooperating with said Z-shaped support member for causing said Z-shaped support member to pivot in such a manner that said Z-shaped support member pivots to expose the utility mechanism through said opening.

4,567,548

CANDLE-SHAPED LUMINARY

Peter Schneeberger, Etzmattenstrasse 40, 7800 Freiburg, Fed. Rep. of Germany

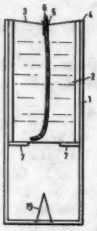
Filed Nov. 21, 1984, Ser. No. 673,677
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343595
Int. Cl.[4] F21L *19/00*
U.S. Cl. 362—161 23 Claims

1. A candle-shaped luminary, comprising:

a cylindrical pipe having an outer coating;

a container to receive liquid fuel exchangeably mounted inside of said cylindrical pipe;

an upper cover for said container corresponding to the approximate width of said cylindrical pipe so that said upper cover abuts seamlessly against the upper edge of said pipe after said container is inserted therein; and



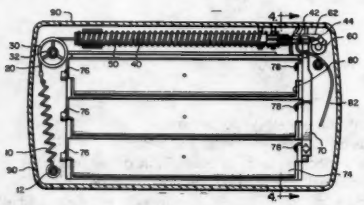
a wick-guiding tube inserted in said upper cover, and having a wick passing therethrough so that said wick reaches into said container and contacts said liquid fuel, said wick protruding from the upper side of said container that is mounted exchangeably in said pipe, said luminary thereby providing an image of the upper area of a natural candle and an increased burning time.

4,567,549

AUTOMATIC TAKEUP AND OVERLOAD PROTECTION DEVICE FOR SHAPE MEMORY METAL ACTUATOR

Charles D. Lemme, Tucson, Ariz., assignor to Blazer International Corp., Franklin Park, Ill.

Filed Feb. 21, 1985, Ser. No. 703,895
Int. Cl.[4] F03G *7/06*; H01H *61/04*
U.S. Cl. 362—279 **10 Claims**



1. An automatic takeup and overload protection device for a shape memory metal actuator for the type comprising an actuator mechanism movable between first and second positions, said device comprising:

a biasing element;

a linkage element defining first and second ends and comprising at least one section of shape memory metal material; said first end fastened to said biasing element and said second end fastened to said actuator mechanism; said section of shape memory metal material operating to move said actuator mechanism to said second position when said shape memory metal material is placed at a selected temperature; and

a restraining element comprising a friction generating surface in physical contact with said linkage element;

said surface cooperating with said linkage element to generate frictional forces of sufficient magnitude to prevent said first end of said linkage element from moving with respect to said surface during movement of said actuator mechanism to said second position and to protect said linkage element from excessive tension by allowing said first end of said linkage element to move with respect to said surface when excessive forces are applied to said linkage element by said actuator mechanism;

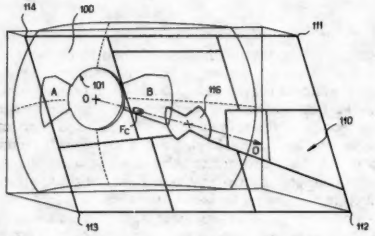
said surface further cooperating with said linkage element to allow said biasing element to move said first end of said linkage element with respect to said surface to substantially maintain a minimum tension of said linkage element between said surface and said actuator mechanism.

4,567,550

AUTOMOBILE HEADLAMP WITH INCLINED FRONT GLASS

Marc Stephano, Gargan, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Apr. 27, 1984, Ser. No. 604,737
Claims priority, application France, Apr. 27, 1983, 83 06945
Int. Cl.[4] F21V *7/09*
U.S. Cl. 362—297 **1 Claim**



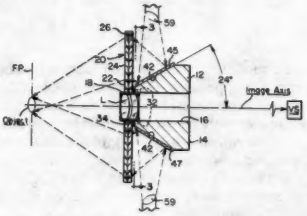
1. An automobile headlamp of the type comprising at least one light source, at least one principal reflector of generally parabolic form having a main focus and a central aperture, said light source being a dipped filament close to said main focus and cooperating with said principal reflector, a front glass which is greatly inclined with respect to the vertical, said reflector having selected critical zones, said zones having an elliptical shape with one focus in the proximity of said light source and the other focus in the proximity of the centre of said glass, said critical zones being formed by two circular sectors arranged to the left and to the right of said principal reflector adjacent said central aperture, the the central zone of said glass corresponding to said critical zones being substantially smooth whereby light rays reflected by said critical zones of said reflector pass through said glass without significant deflection in spite of the inclination of the glass.

4,567,551

MULTI-DIRECTIONAL SURFACE ILLUMINATOR

Albert G. Choate, Honeoye Falls, N.Y., assignor to Automation Gages, Inc., Rochester, N.Y.

Filed Feb. 27, 1984, Ser. No. 583,626
Int. Cl.[4] G02B *21/10*
U.S. Cl. 362—398 **17 Claims**



1. A multi-directional surface illuminator, comprising

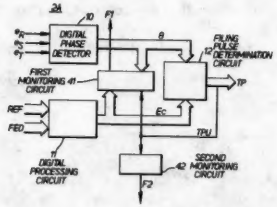
a housing,
means mounted in a bore in said housing to project therethrough the image of an object located in a predetermined position beyond one end of said housing,
a plurality of light sources arrayed around the outside of said housing,
reflective means interposed between said sources and said housing and registering with said sources to reflect light therefrom away from said housing, and
a condenser lens extending transversely of said housing bore with one side thereof confronting on said reflective means to receive therefrom light reflected from said sources, and with the other side thereof facing said predetermined position to focus light from said reflective means obliquely onto an object located in said predetermined position.

4,567,552

PHASE CONTROL DEVICE FOR A POWER CONVERTER

Syunichi Hirose, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 8, 1984, Ser. No. 669,373
Claims priority, application Japan, Nov. 18, 1983, 58-217251
Int. Cl.[4] H02M *7/155;* H02P *13/24*
U.S. Cl. 363—87 **5 Claims**



1. A phase control device for a power converter with a plurality of controlled rectifier elements, comprising:

phase detector means adapted for connection to said power converter to receive an AC voltage of said power converter for detecting a phase of said AC voltage to produce a phase signal, said phase signal including a phase synchronizing signal and a phase judging signal;

processing means adapted for connection to said power converter to receive an electrical quantity appearing at one of an AC side and a DC side of said power converter as a feedback signal for comparing said feedback signal with a reference signal to produce a phase control signal so that said feedback signal becomes equal to said reference signal, said phase control signal including a control signal and an angle signal; and

firing pulse determination means connected to receive said phase signal from said phase detector means and said phase control signal from said processing means for comparing said phase signal with said phase control signal to produce a plurality of firing pulses based on the comparison result, said firing pulses being adapted to be connected to selected of said controlled rectifier elements to fire each of said controlled rectifier elements, said firing pulses outputted at a time determined by the result of the comparison of said phase synchronizing signal with said control signal, wherein it is determined which of said firing pulses is connected to which of said controlled rectifier elements by the result of the comparison of said phase judging signal with said angle signal;

said processing means being connected to receive one of said firing pulses from said firing pulse determination means as a specific firing pulse and said phase signal from said phase detector means and including monitoring means; and

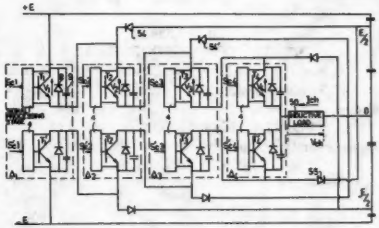
said monitoring means being connected to receive said phase synchronizing signal, said control signal and said specific firing pulse for judging whether or not said phase control device has failed based on said phase synchronizing signal and said control signal upon reception of said specific firing pulse to produce a fault indicating signal based on the judgment result.

4,567,553

STATIC SEMI-CONDUCTOR ELECTRICAL ENERGY CONVERTER ASSEMBLY

Henri Foch, and Jacques Roux, both of Toulouse, France, assignors to Agence Nationale pour la Valorisation et la Recherche (A.N.V.A.R.), Paris, France

Filed Aug. 15, 1983, Ser. No. 523,193
Claims priority, application France, Aug. 16, 1982, 82 14249
Int. Cl.[4] H02P *13/20*
U.S. Cl. 363—98 **8 Claims**



1. A static semi-conductor electrical energy conversion assembly intended to convert a continuous input voltage into an alternating voltage having a peak-to-peak amplitude lower than or equal to said continuous voltage, said assembly comprising:

(a) at least two apparatus wherein,

(i) each apparatus is formed by the association of two converters, each of said converters comprising at least one power stage having at least one controlled blocking static interrupter with a collector, a base and an emitter, and a commutation assist circuit associated with each static interrupter operative to reduce conduction of its collector current during blocking commutations thereof; a control stage adapted to generate a control signal for each static interrupter; an intermediate processing stage associated with each static interrupter having an input connected to the control stage to receive said control signal; and another input connected to said power stage to detect a collector-emitter voltage of each said static interrupter and an output connected to the base of each said static interrupter to trigger the commutations thereof; said intermediate processing stage being adapted to drive the base of each said interrupter so as to interrupt conduction in the single case where, at the same time, said control signal has a value corresponding to a placing in conduction and said collector-emitter voltage is approximately zero whereby reverse polarization of each said interrupter base occurs in all other cases in order to block said interrupter;

(ii) each apparatus formed by the association of said two converters further comprises four power terminals connected to power electrodes of said two static interrupters, said terminals comprising a first collector and a first emitter of the first of said two interrupters and a second collector and a second emitter of the second of said two interrupters, wherein said at least two said apparatus are located in a series, such that said first emitter and said second collector of one apparatus are respectively connected to said first collector and said second emitter of another apparatus, wherein said first collector and said second emitter of said one apparatus

receive said continuous input voltage and wherein said first emitter and said second collector of said another apparatus are connected to each other to form a first output terminal of said assembly for connection to a load;

(b) a voltage distribution stage connected to said first collector and said second emitter of each of said apparatus;

(c) a common control stage for controlling in opposition the two converters of each of said apparatus, wherein said common control stage is adapted to generate, for said two static interrupters of said converters, two control signals of opposite phase and of an appropriate form for the conversion to be performed; and

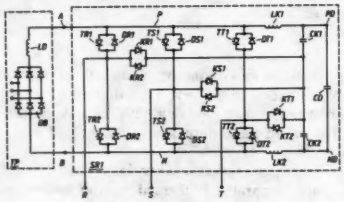
(d) a centralized control unit adapted to provide a delay in said two control signals applied to each of said apparatus, wherein said centralized control unit drives each of said apparatus.

4,567,554

STATIC CONVERTOR MEANS

Gunnar Zetterberg, Västerås, and Lennart Ängquist, Enköping, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 10, 1983, Ser. No. 503,115
Claims priority, application Sweden, Jun. 23, 1982, 8203898
Int. Cl.⁴ H02M *1/06*
U.S. Cl. 363—138 **5 Claims**



1. In a convertor means comprising:

a first convertor including at least two phase groups with forced commutation connected between two busbars;

a series connection comprising a d.c. voltage capacitor connected in series with and between two commutating inductors, common to the phase groups, said series connection being connected between said busbars, each phase group having two series-connected branch portions, the point of connection therebetween constituting a phase terminal of the group, each branch portion comprising a semiconductor means which is controllable in one direction and conducting in the other direction; and

second converter means comprising a second convertor provided with a smoothing inductor being connected to the first convertor for transporting energy between the second convertor means and the first convertor, said second convertor means being connected directly to the busbars.

4,567,555

CURRENT-TYPE GTO INVERTER WITH SURGE ENERGY RESTORATION

Kohki Matsuse, Tama; Hitoshi Hashimoto, Nagoya, and Toshiaki Suzuki, Zushi, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,809
Claims priority, application Japan, Feb. 24, 1984, 59-33804
Int. Cl.⁴ H02M *7/515*
U.S. Cl. 363—138 **1 Claim**

1. In a current type gate turn-off thyristor inverter having AC source terminals for driving an induction motor, comprising:

(a) a GTO bridge-connected inverter;

(b) a thyristor bridge-connected rectifier;

(c) a diode bridge-connected commutation surge voltage rectifier connected to said GTO bridge-connected inverter;

(d) a capacitor connected to said diode bridge-connected commutation surge voltage rectifier for storing a commutation surge voltage energy generated when each of the thyristors of said GTO bridge-connected inverter is turned off;

(e) a cumulative reator having a first winding a positive side of which is connected to a positive terminal of said inverter and a second winding a negative side of which is connected to a negative terminal of said inverter;

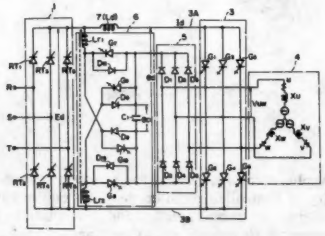
(f) a DC reactor connected between said rectifier and said inverter;

(g) a first gate turn-off thyristor a cathode of which is connected to a negative side of the first winding of said cumulative reactor and an anode of which is connected to a positive side of said capacitor;

(h) a second gate turn-off thyristor a cathode of which is connected to a negative side of said capacitor and an anode of which is connected to a positive side of the second winding of said cumulative reactor;

(i) a first diode an anode of which is connected to the positive side of the second winding of said cumulative reactor and a cathode of which is connected to the positive side of said capacitor; and

(j) a second diode an anode of which is connected to the



negative side of said capacitor and a cathode of which is connected to the negative side of the first winding,

the improvement wherein said first gate turn-off thyristor is turned on during steady state intervals of inverter commutation and off during transient state intervals of inverter commutation, and

said second gate turn-off thyristor is turned on during steady state intervals of inverter commutation and off during transient state intervals of inverter commutation,

and wherein said current type gate turn-off thyristor inverter further comprises:

(k) a third gate turn-off thyristor an anode of which is connected to the positive side of said capacitor and a cathode of which is connected to the positive side of said second winding of said reactor, said third gate turn-off thyristor being turned on while the voltage charged in said capacitor exceeds a predetermined value;

(l) a fourth gate turn-off thyristor an anode of which is connected to the negative side of said first winding of said reactor and a cathode of which is connected to the negative side of said capacitor, said fourth gate turn-off thyristor being turned on while the voltage charged in said capacitor exceeds a predetermined value;

(m) a third diode an anode of which is connected to the negative side of said first winding of said reactor and a cathode of which is connected to the positive side of said capacitor; and

(n) a fourth diode an anode of which is connected to the negative side of said capacitor and a cathode of which is

connected to the positive side of said second winding of said reactor,

whereby the commutation surge voltage energy stored in said capacitor during transient state of motor-driving operation is restored to the positive and negative terminals of said inverter through said first and second gate turn-off thyristors during steady state intervals of inverter commutation, magnetic energy stored in said reactor during transient state of motor-driving operation is recharged to said capacitor through said diode bridge-connected commutation surge voltage rectifier after said first and second gate turn-off thyristors have been turned off, the motor kinetic energy generated during motor-braking operation is stored in said capacitor through said first and second diodes and regenerated to the AC source terminal of said inverter through said third and fourth gate turn-off thyristors when the voltage across said capacitor exceeds a predetermined value, and magnetic energy stored in said reactor during motor-braking operation is recharged to said capacitor through said third and fourth diodes after the said third and fourth gate turn-off thyristors have been turned off.

4,567,556

SEQUENCE CONTROLLING APPARATUS

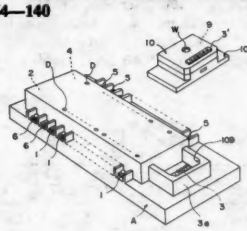
Toshiro Onogi; Kenichi Yoda, and Masahiko Kitamura, all of Mie, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 3, 1982, Ser. No. 354,369

Claims priority, application Japan, Mar. 17, 1981, 56-39070

Int. Cl.[4] G06F *13/00*; H05K *5/00*

U.S. Cl. 364—140 **8 Claims**



1. A sequence controlling apparatus including a control unit and a memory unit detachably mounted to the control unit,

said control unit comprising:

a body having a recess surrounded by a surrounding wall formed integrally with said body;

a plurality of input terminals for receiving a plurality of input signals,

an input circuit connected to said input terminals,

an output circuit,

a plurality of output terminals connected to said output circuit to supply said output signals, and

a first connector connected to said input circuit and said output circuit;

said memory unit comprising:

a second connector selectively connected to said first connector to electrically connect said memory unit to said control unit,

programmable read only memory means disposed in a case and being connected to said input circuit and said output circuit of said control unit via said second connector and said first connector for performing all sequence logical operations in response to said input signals and for providing sequence signals to said output circuit in response thereto, said programmable read only memory having an erasable portion;

said case having a window positioned in juxtaposition to said erasable portion when said programmable read only memory is housed in said case, and

said window being positioned such that incoming light is interrupted by said surrounding wall when said first and second connectors are connected to each other, whereby an undesired erasure of said erasable programmable read only memory is prevented.

4,567,557

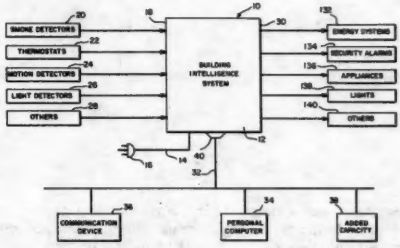
BUILDING INTELLIGENCE SYSTEM

Martin J. Burns, 30-4 Farm Rd., Somerville, N.J. 08876

Filed Feb. 23, 1983, Ser. No. 469,122

Int. Cl.[4] G06F *15/56*

U.S. Cl. 364—145 **11 Claims**



1. An intelligence system for montioring and controlling a plurality of electrical systems, mechanical devices, power-line carrier devices and output devices in a building comprising

input board means to connect a plurality of hard-wired devices to input information from the hard-wired devices;

power-line carrier transmitter means adjacent to the input board means to individually communicate with a plurality of power-line carrier devices;

dedicated computer means mounted adjacent to the input board means and the power-line carrier transmitter means to receive the information from the hard-wired devices and to communicate with the power-line carrier devices through the power-line carrier transmitter means,

the dedicated computer means comprising a first and second plurality of uniformly operating register means to receive information about the building and to store information about the building;

output board means adjacent to the input board means to connect a plurality of output devices, the output board means being in communication with the dedicated computer means to control the operation of the output devices,

the dedicated computer means comprising a third plurality of uniformly operating register means to transmit control information to the output devices;

power supply means to furnsih an uninterruptible power supply to the input board means, the power-line carrier transmitter means, the dedicated computer means and the output board means; and

interface means comprising an interconnection and a personal computer to permit communication between the dedicated computer means and the personal computer.

4,567,558

ELEVATOR TRAFFIC DEMAND ANALYZING SYSTEM

Yasukazu Umeda, Kasugai, and Katsunori Takabe, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,057

Claims priority, application Japan, Apr. 6, 1982, 57-56868; Apr. 6, 1982, 57-56869

Int. Cl.[4] G06F *15/46*; B66B *1/00, 1/18*

U.S. Cl. 364—148 **6 Claims**

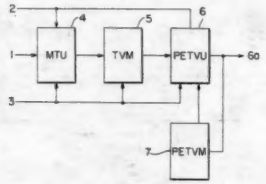
1. A system for controlling a plurality of elevator cars according to a varying traffic demand wherein the demand is

divided into a plurality of time cycles which, in turn, are divided into a plurality of corresponding time periods, said system comprising:

means for generating in each cycle a value indicative of the measured traffic demand in at least one period in the cycle, the periods for which the measured values are generated corresponding from one cycle to another;

first storage means for storing in each cycle the measured values for at least the immediately preceding corresponding period;

means for generating in each cycle a value indicative of an



estimated traffic demand for a corresponding period subsequent to the preceding corresponding period, said estimated value generating means including first estimating means for generating an estimated value in accordance with the measured value in the first storage means, second estimating means for generating an estimated value equal to a previously generated estimted value, and means for selecting between the first estimating means and the second estimating means; and

means for selectively controlling at least one elevator car in accordance with the estimated value generated by the estimated value generating means.

4,567,559

APPARATUS FOR REGULATING A PARAMETER BY ADMITTING AN ADDITIVE INTO A MEDIUM

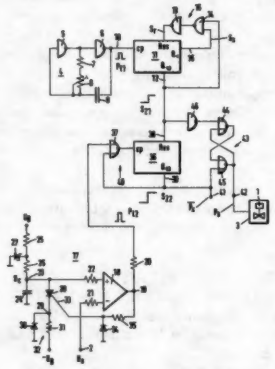
Hermann Berger, and Franz Ernst, both of Heidelberg, Fed. Rep. of Germany, assignors to Chemie und Filter GmbH Verfahrenstechnik KG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,267

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221365

Int. Cl.⁴ G05B *15/02, 19/29;* G01N *15/00*

U.S. Cl. 364—183 **9 Claims**



1. Apparatus for regulating a parameter which at times deviates from a predetermined norm by admitting an additive to a medium, comprising a control signal generator for generating a control signal which is dependent on the departure from said norm and a regulating element which effects the admission of additive for the duration of the control signal, said control signal generator comprising a first timing pulse generator having a constant frequency, a first counter having an input for receiving timing pulses from the first timing pulse generator and an output for generating and transmitting a first counter overflow signal after elapse of a predetermined period during which said input receives a predetermined number of timing pulses, a second timing pulse generator the frequency of which is inversely proportional to said norm, and a second counter having an input for receiving timing pulses from said second timing pulse generator and an output for generating and transmitting a second counter overflow signal after receiving a predetermined number of second timing pulses, said first and second counters being arranged to start counting the signals which are transmitted to their respective inputs in synchronism with one another and said second counter further having a resetting input connected to the output of said first counter, and said control signal generator further comprising a circuit which logically interconnects the first and second counter overflow signals in such a way that the first counter determines the frequency and a time frame in which said additive is added and the second counter determines the duration, within said time frame, for which the additive is added.

4,567,560

MULTIPROCESSOR SUPERVISORY CONTROL FOR AN ELEVATOR SYSTEM

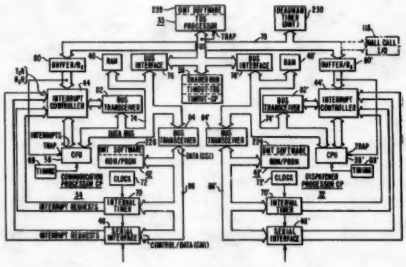
Marjorie J. Polis, Morris Township, Morris County, and Alan L. Husson, Hackettstown, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1983, Ser. No. 530,808

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.⁴ G05B *15/02;* B66B *1/00;* G06F *11/16*

U.S. Cl. 364—184 **3 Claims**



1. An elevator system, comprising:

a plurality of elevator cars;

a control system for controlling said plurality of elevator cars including a dispatcher processor, a communication processor for polling the elevator cars for information for use by said dispatcher processor, and for selecting an elevator car to receive information from said dispatcher processor, a memory, a system bus interconnecting said dispatcher processor, said communication processor, and said memory, with said memory being shared by said master processor and said communication processor via said system bus;

said dispatcher processor including means for preparing car mode information for said elevator cars, and means for writing said car mode information into said shared memory;

said communication processor including means for reading said shared memory to obtain car mode information, and means for transmitting said car mode information to associated elevator cars;

said elevator cars including means for providing car status information;

said communication processor including means for obtaining car status information from the elevator cars, and means for writing said car status information into said shared memory;

said dispatcher processor including means for reading said shared memory to obtain said car status information;

a selected one of the dispatcher and communication processors being a master processor, with the non-selected processor being a slave processor;

said slave processor including storage means, and program means stored in said storage means for periodically setting a predetermined location of said shared memory;

said master processor including storage means, and diagnostic program means stored in said storage means, said diagnostic program means including checking means for periodically checking said predetermined location to determine if it is set or reset, resetting means for resetting the predetermined location each time the checking means finds said predetermined location set, detecting means for periodically determining if the operation of the master processor is normal or abnormal, and trigger signal means for providing trigger signals;

said trigger signal means providing a trigger signal responsive to the checking means finding said predetermined location of said shared memory set and the detecting means detecting normal operation of the master processor, with said trigger signals being provided by trigger signal means at a predetermined triggering rate when the checking and detecting means continue to respectively find said predetermined location of the shared memory set, and normal operation of the master processor;

and a single retriggerable hardware timer in communication with said master processor via said system bus, said hardware timer being responsive to the trigger signals provided by the trigger signal means of said master processor;

said hardware timer having a predetermined timing period when triggered by a trigger signal, with said predetermined timing period being selected such that the predetermined triggering rate of the trigger signals prevents said hardware timer from reaching the end of said predetermined timing period;

said trigger signal means of the master processor ceasing to provide trigger signals as a function of either said checking means finding said first predetermined location of said shared memory reset or the detecting means detecting abnormal operation of said master processor,

said hardware timer applying an interrupt signal to said system bus when it reaches the end of its timing period;

said master processor and said slave processor including first and second interrupt responsive program means, respectively, which reinitialize the master processor and slave processor in response to the interrupt signal being placed on the system bus by said hardware timer.

4,567,561

LARGE SCALE INTEGRATION DATA PROCESSOR SIGNAL TRANSFER MECHANISM

Virgil D. Wyatt, Lighthouse Point; Wayne R. Kraft, Coral Springs, and Nandor G. Thoma, Boca Raton, all of Fla., assignors to International Business Machines Corp., Purchase, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,185
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **10 Claims**

1. In large scale integration data processor circuitry formed on an integrated circuit chip, a signal transfer mechanism comprising:

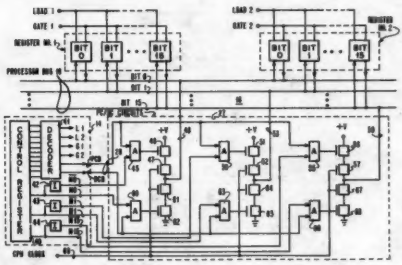
a plural-bit bus formed on the integrated circuit chip for transferring plural-bit binary signals between different locations on the chip;

a microword control storage mechanism responsive to each processor instruction for producing a sequence of microwords for each processor instruction for controlling the execution of each processor instruction;

control circuitry responsive one at a time to the microwords from the control storage mechanism for producing for each microword a plurality of control point signals for controlling the operation of the data processor for one microword cycle;

plural-bit signal source circuitry formed on the integrated circuit chip and coupled to the plural-bit bus for supplying plural-bit binary signals thereto;

circuitry for supplying a control point signal produced during a first microword cycle to the signal source circuitry



for enabling it to put its plural-bit binary signal onto the plural-bit bus during this first microword cycle;

plural-bit signal destination circuitry formed on the integrated circuit chip and coupled to the plural-bit bus for receiving plural-bit binary signals therefrom;

and circuitry for supplying a control point signal produced during a second and different microword cycle to the signal destination circuitry for enabling it to take in during this second microword cycle the plural-bit binary signal put out by the signal source circuitry;

the inherent capacitance of the plural-bit bus serving to store the plural-bit binary signal during the first and second and any intervening microword cycles.

4,567,562

CONTROLLER FOR CONTROLLING ACCESS TO A PLURALITY OF RECORDS THAT CAN BE ACCESSED AND CHANGED BY SEVERAL INDEPENDENT PROCESSORS

Charles J. Fassbender, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 21, 1983, Ser. No. 515,769
Int. Cl.[4] G06F *15/16, 12/06*
U.S. Cl. 364—200 **9 Claims**

1. A controller, for controlling access to a plurality of records that can be accessed and changed by several independent processors, comprising:

a plurality of flip-flops corresponding in number to said plurality of records with each flip-flop representing a particular record;

a means for receiving a control word from any of said processors which identifies multiple records, up to a maximum number, of which access is sought;

a means, coupled to said means for receiving and said flips-flops, for selecting in parallel and logically ANDing output signals from all of those flip-flops which correspond to said identified records;

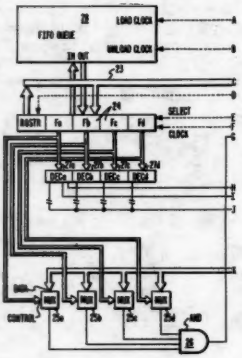
a means, coupled to said means for selecting, for sending a signal if said ANDing operation yields a logical ONE to the processor which sent said control word signaling that it may access and change said identified records;

a means, coupled to said means for selecting and said flip-flops, for setting all of those flip-flops which correspond

to said identified records if said ANDing operation yields a logical ONE;

a means, coupled to said means for receiving and said means for selecting, for storing said control word if said ANDing operation yields a logical ZERO; and

a means for registering another control word from any of said processors which identifies multiple records, up to said maximum number, and indicates access to them is complete;



a means for resetting all of those flip-flops which correspond to the records that said another control word identifies a means, coupled to said means for storing and said means for receiving, for moving a control word from said means for storing into said means for receiving in response to the resetting of any one of said flip-flops by one of said processors; said means for selecting, means for sending, means for setting, and means for storing operating on such moved control word in the same manner as if it was received directly from one of said processors.

4,567,563

IRRIGATION CONTROL SYSTEM

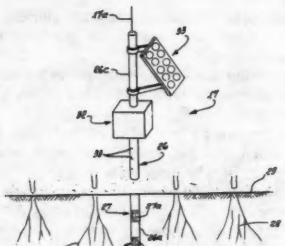
Michael Hirsch, Pacific Palisades, Calif., assignor to Energy Management Corporation, Los Alamitos, Calif.

Continuation-in-part of Ser. No. 221,519, Dec. 30, 1980, Pat. No. 4,396,149. This application Jul. 11, 1983, Ser. No. 512,667

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.⁴ A01G *25/16*; B05B *12/12*; G06F *15/54*

U.S. Cl. 364—420 **28 Claims**



1. In irrigation control apparatus, the combination comprising

(a) a mast having a lower portion adapted to be removably inserted into the earth, and an upper portion operatively connected with said lower portion and adapted to be deflected laterally when struck,

(b) soil moisture sensing means to be inserted into the earth to controlled depth to sense moisture at said depth,

(c) and data transmitting means on an upper portion of the mast and operatively connected with said sensing means for transmitting to a central station substantially continous measurement data corresponding to moisture levels continuously sensed by said (b) means at the location of the mast.

4,567,564

ARRANGEMENT FOR THE ATTITUDE STABILIZATION OF FLEXIBLE VEHICLES WITH WEAKLY-DAMPENED STRUCTURAL VIBRATIONS AND DISCONTINUOUS CONTROL INTERVENTION

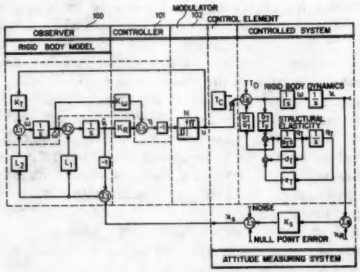
Helmut Bittner, Munich; Eveline Gottzein, Oberpframmern, and Michael Surauer, Chieming, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,359

Claims priority, application European Pat. Off., Aug. 19, 1980, 80104916.4

Int. Cl.⁴ B64G *1/20*

U.S. Cl. 364—434 **19 Claims**



2. In an arrangement for the attitude stabilization of flexible vehicles, such as aircraft and spacecraft, which, due to their lightweight construction and/or large spatial extension or their high degree of slenderness, have, structurally, weakly-dampened, bending vibrations and/or torsional vibrations, and in which, for generating the forces and moments required for stabilization of the vehicle, discontinuously operating actuators are used, the improvement comprising that for each vehicle axis, there are:

(a) only a single observer means responsive to signals representing attitude measurements for providing signals representing estimated values of the state variables of the vehicle system to be controlled, said observer means having a transfer function of at most third order;

(b) state controller means, responsive to the observer means, for providing signals for controlling the state variables;

(c) means, responsive to the state controller means, for modulating the signal produced by the state controller means, and having a relay characteristic;

(d) means for supplying a feedback signal from the input of the modulating means to the observer means; and

(e) a low pass filter at the output side of the state controller means and at the input side of the modulating means, said filter having either a pair of low pass filter sections with first order transfer functions or a single low pass filter section with at least a second order transfer function, the break-point frequencies of the first order transfer functions or second order transfer functions being between the natural resonance frequency for position stabilization and

the natural resonant frequency of vibration stabilization for the vehicle axis to be stabilized;

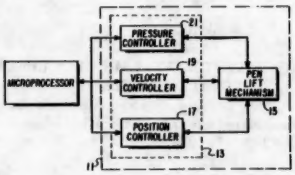
wherein the actuators are responsive to said modulating means and act upon the vehicle with the stabilization forces and moments, respectively, produced by the actuators.

4,567,565

APPARATUS AND METHOD FOR PEN-LIFT SYSTEM

Robert D. Haselby, Escondido; Samuel R. Haugh, Mountain View, and Lowell J. Stewart, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1981, Ser. No. 317,980
Int. Cl.[4] G05B *19/18*
U.S. Cl. 364—520 25 Claims



11. A method for vertically positioning a plotter pen relative to a platen supporting a recording medium thereon, comprising the steps of:

determining a horizontal pen movement desired distance; and

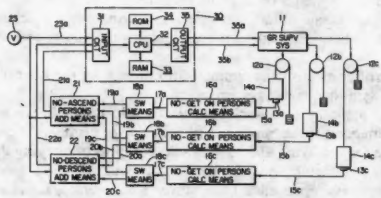
comparing the desired distance to a predetermined critical distance and raising the pen to a short height if the desired distance is less than or equal to the critical distance and raising the pen to a long height if the desired distance is greater than the critical distance.

4,567,566

DEMAND ESTIMATION APPARATUS

Shinji Araya, Takarazuka, and Shintaro Tsuji, Nagoya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 8, 1983, Ser. No. 473,359
Claims priority, application Japan, Jun. 28, 1982, 57-111165
Int. Cl.[4] G06F *15/56, 15/46;* B66B *1/20*
U.S. Cl. 364—554 8 Claims



1. A demand estimation apparatus for controlling machines wherein a cycle of a substantially cyclically fluctuating demand is divided into a plurality of sections of given time width and wherein an estimated value of the demand in each section is found on the basis of a measured result of the demand in the section, said apparatus comprising:

means for setting ad adjusting section having a time width smaller than said given time width of said adjoining sections to include a boundary between sections adjoining each other,

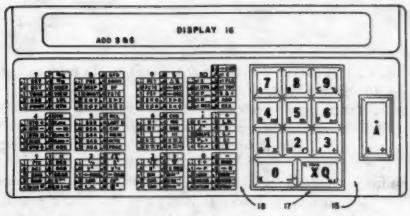
means for comparing an estimated demand value of said adjusting section obtained from a measured result of the demand for a predetermined period in said adjusting section, with estimated demand values of said two sections adjoining the adjusting section and for correcting said boundary in one direction or the opposite direction in accordance with the comparison so that the average estimated demand value in the adjusting section is substantially intermediate the estimated demand values of both adjoining sections, delivering means for delivering the adjusted estimated demand values of the adjoining sections with the corrected boundary, and means for controlling machines in accordance with the adjusted values.

4,567,567

COMPUTER KEYBOARD DISPLAYING MANY OPERATING INSTRUCTIONS WITH FEW KEYS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jan. 21, 1983, Ser. No. 459,997
Int. Cl.[3] G06F *3/027*
U.S. Cl. 364—709 7 Claims



1. A computer for performing a plurality of calculations with few keyboard keys on a keyboard having a register for retaining numerical digits of a numerical word, numerical digit entry keys and a decimal point key, said computer being of the type having a numerical entry mode for entering in sequence a set of numerical digits to form a numerical word and characterized by means employing the decimal point key as a control key for terminating and entering the numerical word into said register of the computer by establishing a mode of operation of the decimal point key in response to means detecting the second occurrence of a decimal point keystroke by said decimal point key within a word to initiate a control mode for entering that word into the computer register.

4,567,568

APPARATUS FOR DIVIDING THE ELEMENTS OF A GALOIS FIELD

Jun Inagawa, Yokohama; Masahide Nagumo, Kawasaki, and Tadashi Kojima, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 10, 1983, Ser. No. 473,767
Claims priority, application Japan, Jun. 15, 1982, 57-102804; Jun. 15, 1982, 57-102807
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—761 2 Claims

1. An apparatus for dividing one element α^i of a Galois field GF(2^m), consisting of 2^m elements divided into n groups, by another element α^j, thus performing a division of:

$\alpha^i \div \alpha^j (=\alpha^{i-j})$, where α is the root of a modulus polynomial $F_{(x)}$, said apparatus comprising:

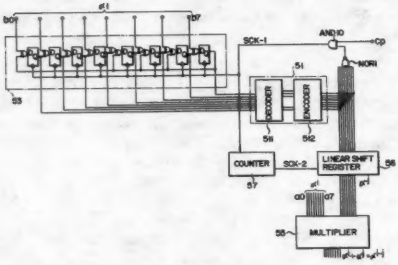
reciprocal data memory means for storing data representing reciprocals of n elements located at specific positions respectively in n groups;

a first linear shift register for storing data representing the element α^j;

comparator means for comparing the data stored in said first linear shift register with the data stored in said reciprocal

data memory means, to thereby deliver data representing the reciprocal of the data stored in said reciprocal data memory means;

first shifting means for detecting the number of times said reciprocal data memory means produces no output when said comparator means performs the data comparison, and for generating a shift signal to shift said first linear shift register by N times according to the detecting result;



a second linear shift register for storing data $\alpha^{-(J+N)}$ from said reciprocal data memory means;

second shifting means for counting said shift signal from said first shifting means and shifting said second linear shift register a number of times determined by the counting result and;

multiplier means for multiplying $\alpha^{-(J+N)+N}=\alpha^{-J}$, output from said second linear shift register, by said element α^{I}, thereby providing an output of α^{I-J}, where $0 \leq N \leq n-1$.

4,567,569

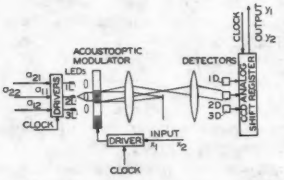
OPTICAL SYSTOLIC ARRAY PROCESSING

Henry J. Caulfield, Huntsville, Ala., and William T. Rhodes, Atlanta, Ga., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 15, 1982, Ser. No. 450,153

Int. Cl.⁴ G06G *9/00, 7/16;* G02B *6/10*

U.S. Cl. 364—845 **12 Claims**



1. A method for providing a series of analog quantities that are proportional respectively to the components of a third array that is the product of a first array of components multiplied by a second array of components in a predetermined order, comprising,

directing light of intensity proportional to the first component of the first array to the light side of modulating means whose output light intensity is proportional to a known function of an electrical signal applied to it,

applying to the modulating means, while the light is passing through it, a signal proportional to a function of the first component of the second array such that the intensity of the output light from the modulating means is proportional to a known function of the product of the two first components,

then, after a predetermined time:

directing light of intensity proportional to the second component of the first array to the input side of modulating means whose output light intensity is proportional to a known function of an electrical signal applied to it,

applying to the modulating means, while the light is passing through it, a signal proportional to a function of the second component of the second array such that the intensity of the output light from the modulating means is proportional to a known function of the product of the two second components, and so on, in the same manner, and finally with the last component of the first array and the last component of the second array to provide an electrical signal that is proportional to a known function of the product of the two last components, and

providing a series of output signals responsive to the sums of predetermined groups of output light intensities and proportional respectively to the components of the third array.

4,567,570

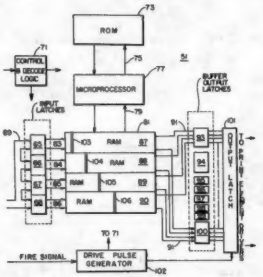
ELECTRONIC CONTROL SYSTEM FOR A LINEARLY SLANTED PRINT HEAD

Thomas R. Peer, New Milford, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 16, 1983, Ser. No. 467,040

Int. Cl.⁴ G06F *3/12*

U.S. Cl. 364—900 **18 Claims**



1. In a matrix printer including a print head consisting of J print elements linearly arranged on a slant relative to a horizontal plane, an electronic system for processing vertical columns of imaging data bits inputted from a data processor to produce control signals for operating said print head, for printing a desired image on a print medium in the same vertical orientation as said inputted image data, during times of relative movement between said print head and print medium, comprising:

controller means programmed for controlling the operation of said electronic system;

input memory means responsive to said controller means initialized at the beginning of each line of print, and operable for receiving and storing said columns of imaging data bits in equal distribution between L banks of said memory means, wherein each bank stores a different 1/L column portion of each one of said vertical columns of imaging data bits, the related L columns in said banks of memory being skewed from one another by the equivalent of the number of columns of print capability I times J/L, thereby pre-skewing or partially skewing said imaging data;

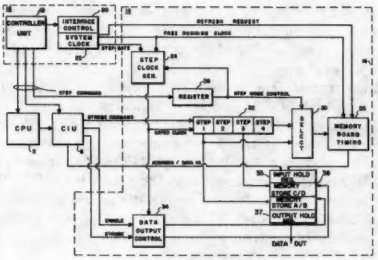
output memory means responsive to said controller means for completing or fully skewing said image data by making Q successive fetches from said input memory means during each cycle of printing, where Q=J/L, and where on a first fetch the first bits of each one of said L different preskewed columns of data bits in said L banks of said input memory means, respectively, that form the full column of data bits at the appropriate fetched memory address from said input memory means, are written into a

first portion of said output memory means, on a second fetch decrementing by I from the initial input memory means address of said first fetch, for writing into a second portion of said output memory means immediately following said first portion, the second bits of each one of said L column segments of data at said decremented address, respectively, followed by decrementing by 2I from the initial input memory means address for fetching the third bits of each column or byte of data at this decremented address, respectively, and writing these third bits into a third portion adjacent said second portion of said output memory means, and continuing in an iterative manner until Q fetches and (Q−1) decrements have been made, where Q=J/L, for writing into said output memory means the successive data bits required, for providing the necessary control signals for printing the portions of image data columns under the print head at that given time.

4,567,571
MEMORY CONTROL FOR REFRESHING IN A STEP MODE

Richard C. Moffett, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Continuation of Ser. No. 415,130, Sep. 7, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 702,112
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—900 **2 Claims**



1. A computer system, having a memory unit which includes a volatile memory store, and a memory control circuit connected to said memory unit for permitting the computer system to be operated in a step mode, said memory control circuit comprising:

(a) step clock generator means, having a first, second, and third input terminal adapted to receive a free running clock signal, a step gate signal, and a step mode control signal, respectively, for generating a gated clock signal, said gated clock signal coupled to at least said volatile memory store, said free running clock signal supplying a basic timing for said computer system;

(b) register means, having an input terminal for receiving a step command signal, said step command signal being an indication from said computer system that the memory unit is to be operated in the step mode, for generating the step mode control signal in response to said step command signal, said step mode control signal being coupled to the third input terminal of said step clock generator means;

(c) shift register means having a plurality of stages, further having an input terminal for receiving a strobe command signal from the computer system, said strobe command signal indicating a request for a memory cycle, and having a second input terminal operatively connected to the step clock generator means for receiving said gated clock signal, a first stage of said shift register means having an output operatively connected to said volatile memory store for delaying the strobe command signal, each stage of said shift register means representing a successive step when the computer system is operated in the step mode;

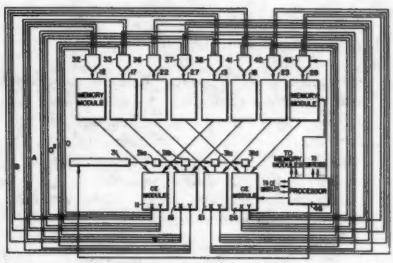
(d) selector means, having a first input terminal operatively connected to said first stage of said shift register means to receive said delayed strobe command signal, and having a second input terminal operatively connected to a second stage of said shift register means to receive a further delayed strobe command signal, for selecting between said delayed strobe command signal and said further delayed strobe command signal to output a selected strobe command signal in response to the step mode control signal; and

(e) memory unit timing means, operatively connected to said selector means to receive the selected strobe command signal, and having a first and second input terminal which receive the free running clock signal, and a refresh request signal, respectively, for correlating the selected strobe command signal to the refresh request signal to output an initiate cycle signal thereby initiating the memory cycle requested by the computer system and a memory refresh cycle of said volatile memory store when said correlation occurs.

4,567,572
FAST PARALLEL SORTING PROCESSOR

S. Brent Morris, Columbia, and Richard A. Wisniewski, West Friendship, both of Md., assignors to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Filed Feb. 22, 1983, Ser. No. 468,423
Int. Cl.⁴ G06F *7/16*
U.S. Cl. 364—900 **3 Claims**



1. Apparatus for sorting 2^v words, where v is an integer of value equal to or greater than k, comprising:

a programmed processor;

2^k memory modules, where k is an integer of value greater than one, each comprising an input, an output, and means for storing 2^{v-k} words to be sorted;

2^{k-1} means connected to the outputs of said memory modules for comparing a word in the Mth memory module with a word in the $M+2^{k-1}$th memory module, for $0 \leq M < 2^{k-1}$, and for providing a first selected one of said words to a first output of said comparing means and for providing a second selected one of said words to a second output of said comparing means in response to first control signals from said processor;

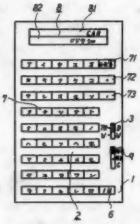
2^k switches, each having an output coupled to the input of a separate one of said memory modules, and a plurality of inputs coupled to the outputs of selected ones of said comparing means, said switches responding to second control signals from said processor for effecting interconnections between the outputs of said comparing means and the inputs of said memory modules according to an algorithm being processed by said processor and predetermined by the values of v and k.

4,567,573

ELECTRONIC LANGUAGE INTERPRETER WITH FACULTIES FOR MEMORIZING AND ERASING NEW WORDS EXTERNALLY APPLIED THERETO

Shintaro Hashimoto, Ikoma, and Akira Tanimoto, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 110,689, Jan. 9, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,269
Claims priority, application Japan, Jan. 10, 1979, 54-1824
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—900 12 Claims



1. An electronic dictionary and language interpreter comprising:

read/write memory means for storing source word data and associated translation data, said source word data representing a source word in a first language and said translation data representing a translation word which is a translation of said source word in a second language;

input means for introducing said source word data and translation data into said read/write memory means when said interpreter is in a storage mode;

said input means further introducing data into said interpreter representative of a desired word in said first language to be translated when said interpreter is in a translation mode;

said interpreter further having a word cancellation mode;

means, operatively interconnected to said input means, for selecting between said storage mode, said word cancellation mode and said translation mode;

read only memory means for containing a volume of source word data and associated translation data;

search means for comparing said desired word data introduced by said input means with said source word data within said read only memory means and said read/write memory means and, upon detection of a coincidence therebetween, for recalling the translation data associated with said source word data from said read/write or said read only memory means;

means responsive to said search means for outputting said translation data recalled by said search means to thereby provide a translation of said desired word; and

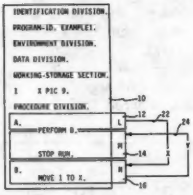
means for selectively cancelling source word and translation data in a particular portion of said read/write memory means, said means for selectively cancelling being responsive to said mode selection means to select and cancel the source word and translation data corresponding to a desired word entered by said input means.

4,567,574

OPTIMIZING COBOL OBJECT CODE INSTRUCTION PATH LENGTH WITH RESPECT TO PERFORM STATEMENTS

Henry Y. Saadé , San Jose, and William N. J. Tindall, San Martin, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,909
Int. Cl.[4] G06F *9/00, 9/30*
U.S. Cl. 364—900 3 Claims



1. A method for execution on a digital computer for optimizing the instruction path length in the compilation of COBOL source code, said source code including PERFORM statements and preselected procedures associated therewith, an improvement comprising the steps of:

(a) ascertaining the control transfer relationship among PERFORM statements and their associated procedures, and characterizing said ascertained relationship in a vector of attributes for each PERFORM statement including whether an associated procedure is OPEN or CLOSED; and

(b) interpreting the vectors such that if the vector for any given PERFORM statement indicates that:

(1) the procedure associated therewith is CLOSED, then the code constituting the procedure is substituted for the code constituting the PERFORM statement, or

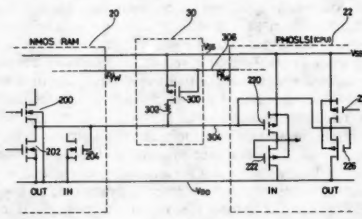
(2) the procedure associated therewith is OPEN, then a simplified transfer and return of control code is substituted for the original code constituting the transfer and return of control.

4,567,575

VOLTAGE LEVEL COMPENSATING INTERFACE CIRCUIT FOR INTER-LOGIC CIRCUIT DATA TRANSMISSION SYSTEM

Mitsuo Morihisa, Nara, and Hideyuki Akao, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 309,047, Oct. 6, 1981, abandoned. This application Apr. 26, 1985, Ser. No. 726,933
Claims priority, application Japan, Oct. 14, 1980, 55-146710[U]
Int. Cl.[4] G06F *3/04*
U.S. Cl. 364—900 4 Claims



1. A data signal transmission system in an electronic apparatus comprising:

at least two semiconductor logic circuits;

said at least two semiconductor logic circuits including:

a first semiconductor logic circuit in which an output voltage level of a logic "high" bears a first voltage level; and

a second semiconductor logic circuit in which an input voltage level of a logic "high" bears a second voltage level, wherein said second voltage level is higher than said first voltage level;

interface circuit means disposed between said at least two semiconductor logic circuits for transferring data signals between said first and second semiconductor logic circuits in either direction;

said interface circuit means consisting essentially of:

a single signal transmission line interconnecting said first and second semiconductor circuits for transfer of each information bit;

pull-up circuit means for pulling up said signal transmission line to a desired voltage level so that when said output voltage level of said first semiconductor logic circuit is a logic "high" the level on said signal transmission line is raised at least to said second voltage level; and

a switching element operatively interconnected between said signal transmission line and said pull-up circuit means; and

a control system for switching said switching element so that said signal transmission line is connected to said pull-up circuit means only when a said data signal is transferred from said first semiconductor logic circuit to said second semiconductor logic circuit.

4,567,576

METHOD FOR PRODUCING A MAGNETIC BIAS FIELD

Yoshio Tawara; Ken Ohashi, both of Fukui, and Hideaki Kikuchi, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 425,956, Sep. 28, 1982, abandoned. This application Feb. 14, 1984, Ser. No. 579,996

Claims priority, application Japan, Oct. 2, 1981, 56-156988

Int. Cl.[4] G11C *5/02*

U.S. Cl. 365—2 **4 Claims**

1. A method for producing a magnetic bias field in a magnetic bubble domain memory device, said method comprising coupling a magnetic bubble domain element with a permanent magnet, said permanent magnet being formed of a rare earth metal-containing alloy having the general formula

$$R(Co_{1-x-y}Cu_xNi_y)_z$$

in which R is a rare earth element and x, y and z are each positive numbers, x ranges from 0.001 to 0.4, y ranges from 0.001 to 0.6, and z ranges from 4.0 to 9.0, with the proviso that x+y is less than 1.

4,567,577

IMPEDANCE MODULATED CMOS RAM CELL

Arthur B. Oliver, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1982, Ser. No. 439,161

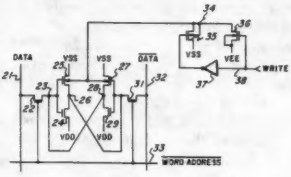
Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—156 **4 Claims**

1. A random access memory cell of complementary field effect transistors comprising:

a latch for storing bit information connected to a word address line and a data line to receive bit information from said data line when said word address line is active, said latch including first and second inverter circuits, each of said inverter circuits having an output coupled to the input of the other inverter circuit;

switching means connected to said latch for enabling new data information to be stored in said latch by disabling a



portion of each of said first and second inverter circuits of said latch.

4,567,578

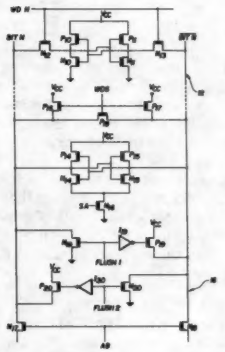
CACHE MEMORY FLUSH SCHEME

Paul Cohen, Ashland, Mass., and William R Young, Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 8, 1982, Ser. No. 416,034

Int. Cl.[4] G11C *11/40, 7/00*

U.S. Cl. 365—189 **6 Claims**



1. In a memory having a memory array, a word decoder and a bit decoder, the improvement comprising:

said word decoder including for each word line a word line switch means for connecting a word line signal to said word line when activated by said word decoder in response to a word address and a word precharge means for activating said word line switch prior to word decoding; and

write means activating said word precharge means in response to an all write signal for connecting a word line signal to said word line and for writing a specific logic value in all the memory locations in said memory array simultaneously in response to said all write signal without addressing said word and bit decoders.

4,567,579

DYNAMIC MEMORY WITH HIGH SPEED NIBBLE MODE

Pravin P. Patel, and Chitranjan N. Reddy, both of Sugarland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 8, 1983, Ser. No. 512,076

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—189 **15 Claims**

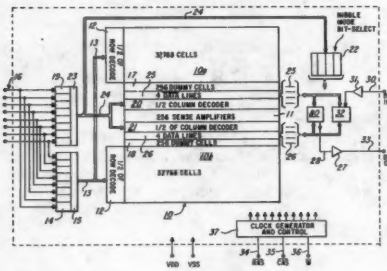
1. A semiconductor memory device having an array of N rows and M columns of memory cells, and M column lines coupled to said columns of cells, the column lines being groups

of B columns per group, and addressing means for selecting a particular row and column based upon an address, comprising:

output lines extending to all of said groups of columns, there being B output lines to simultaneously provide B bits of data from selected memory cells,

selector means in said addressing means for selecting only one of said groups of columns to connect to said B output lines,

sequential output selection means receiving bits of said address to select one of said B output lines as a beginning bit and to sequence through the remaining B output lines for



output of data therefrom, said selection means including decoder means responsive to said address, shift register means for circulating a bit from a starting point determined by said decoder means, and control latch means to temporarily hold outputs of the decoder means and shift registers means,

a plurality of B output data latches each coupled to one of said output lines and holding all of the B bits of data,

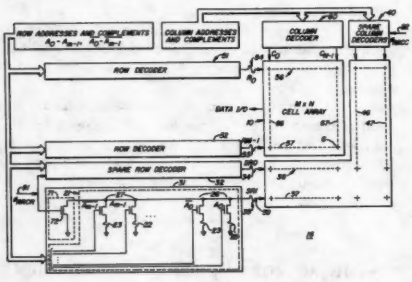
and means for coupling said B bits of data from said output data latches to a single output terminal in a sequence determined by the contents of said control latch means.

4,567,580

REDUNDANCY ROLL CALL TECHNIQUE

Ramesh C. Varshney, San Jose, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Jun. 29, 1983, Ser. No. 508,782
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—200 **12 Claims**



1. For use in an integrated circuit having addressable elements coupled to decoders, combinations of elements and decoders capable of being replaced through substitution of at least one redundant element and at least one redundant decoder connected to the redundant element, apparatus for disabling the redundant decoder comprising:

a test circuit for generating a control signal, the test circuit responsive to an out-of-normal-range test signal applied to an external terminal of the integrated circuit coupled to the test circuit; and

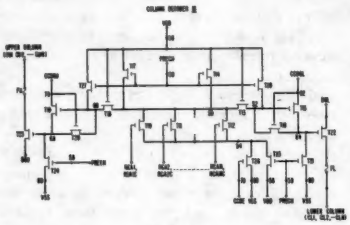
a disabling circuit connected to receive the control signal and connected to the redundant decoder for disabling the redundant decoder in response to the control signal.

4,567,581

COLUMN DECODER CIRCUIT FOR USE WITH MEMORY USING MULTIPLEXED ROW AND COLUMN ADDRESS LINES

Austin C. Dumbri, Easton, and Frank J. Procyk, Center Valley, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 22, 1982, Ser. No. 452,156
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—230 **17 Claims**



17. Address decoding circuitry which is for use in a memory which is supplied with both row and column address information of which only the column address information is intended to activate the circuit comprising a plurality of decoding transistors, the number of which being determined by the length of address, each comprising a control terminal to which the address information is applied and first and second output terminals comprising:

means for setting the first output terminal of each transistor at a first potential level prior to the application of all input address information to the control terminal of the transistor:

means for setting the potential of the second output terminal of each transistor to a second level which is different from the first level prior to or during or after the application of column input address information whereby each transistor is activated for decoding; and

means for setting the potential of the second output terminal of each transistor to the first level prior to the application of row input address information.

4,567,582

DIRECT DETERMINATION OF STACKING VELOCITIES IN THREE DIMENSIONAL SEISMIC PROSPECTING

Milos J. Kuhn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1982, Ser. No. 395,207
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—56 **7 Claims**

4. A method for determining the stacking velocity in any direction around a common midpoint M comprising the steps of:

generating acoustic waves in the earth at a first seismic source location on a first line which originates at said common midpoint M;

establishing a first output signal representative of the output of a first seismic receiver located on a second line which is an extension of said first line from said common midpoint M, wherein said first seismic source location and said first seismic receiver are substantially equidistantly spaced from said common midpoint M;

generating acoustic waves in the earth at a second seismic source location on said first line;

establishing a second output signal representative of the output of a second seismic receiver located on said second line wherein said second seismic source location and said second seismic receiver are substantially equidistantly spaced from said point M;

generating acoustic waves in the earth at a third seismic source location on a third line which originates at said common midpoint M;

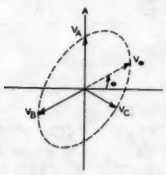
establishing a third output signal representative of the output of a third seismic receiver located on a fourth line which is an extension of said third line from said common midpoint M, wherein said third seismic source location and said third seismic receiver are substantially equidistantly spaced from said common midpoint M;

generating acoustic waves in the earth at a fourth seismic source location on said third line;

establishing a fourth output signal representative of the output of a fourth seismic receiver located on said fourth line, wherein said fourth seismic source location and said fourth seismic receiver are substantially equidistantly spaced from said common midpoint M;

generating acoustic waves in the earth at a fifth seismic source location on a fifth line which originates at said common midpoint M;

establishing a fifth output signal representative of the output



of a fifth seismic receiver located on a sixth line which is an extension of said fifth line from said common midpoint M, wherein said fifth seismic source location and said fifth seismic receiver are substantially equidistantly spaced from said common midpoint M;

generating acoustic waves in the earth at a sixth seismic source location on said fifth line which originates at said common midpoint M;

establishing a sixth output signal representative of the output of a sixth seismic receiver located on said sixth line, wherein said sixth seismic source location and said sixth seismic receiver are substantially equidistantly spaced from said common midpoint M;

determining a first stacking velocity in the direction of said first and second lines in response to said first and second output signals;

determining a second stacking velocity in the direction of said third and fourth lines in response to said third and fourth output signals;

determining a third stacking velocity in the direction of said fifth and sixth lines in response to said fifth and sixth output signals; and

determining the equation of an ellipse based on the magnitude of said first stacking velocity, the magnitude of said second stacking velocity and the magnitude of said third stacking velocity, wherein the equation of said ellipse determines the stacking velocity in any direction about said common midpoint M.

4,567,583

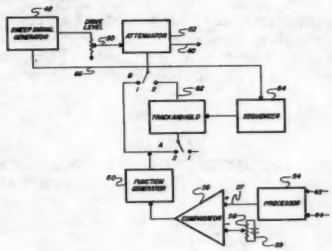
ADAPTIVE PRESET FORCE LEVEL CONTROL FOR A SEISMIC VIBRATOR

Ralph A. Landrum, Jr., Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Sep. 23, 1983, Ser. No. 535,215

Int. Cl.[4] G01V *1/14*

U.S. Cl. 367—190 **5 Claims**



1. In a seismic vibrator for shaking the earth at a plurality of stations along a line of survey, the vibrator including at least an earth-contacting base plate that is reciprocably driven relative to an inertia mass by an electrohydraulic, servo-controlled linear actuator in response to an input sweep signal having a desired time duration, a method for adaptively modulating the level of selected portions of said input sweep signal, comprising:

(a) generating a control signal having a level that is a function of the force applied to the earth by said base plate;

(b) modulating the level of the input sweep signal by use of said control signal, during a first sweep;

(c) sampling the level of said control signal during a desired portion of said first sweep and storing said sample to define a preset signal;

(d) modulating the level of the input sweep signal of a subsequent sweep by the so-defined preset signal derived from the first sweep only during an initial portion of said subsequent sweep.

4,567,584

AUTOCHANGER TYPE DISC PLAYER

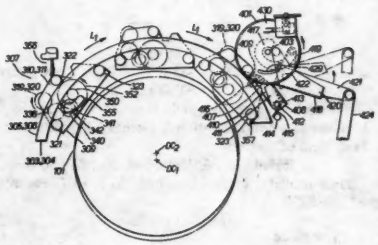
Hiroshi Kawakami, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 8, 1984, Ser. No. 618,944

Claims priority, application Japan, Jun. 13, 1983, 58-105296; Dec. 27, 1983, 58-244465

Int. Cl.[4] G11B *17/22*

U.S. Cl. 369—38 **12 Claims**



1. An autochanger type disc player for automatically accessing, playing and storing at least one disc having a curved periphery, the autochanger type disc player comprising:

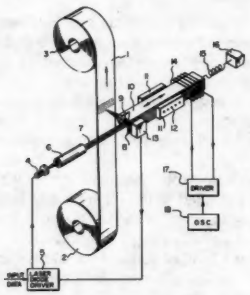
a disc storage section including means for supporting said at least one disc;
a disc playback section;
a disc transferring passage coupled between said disc storage section and said disc playback section for transferring said at least one disc between said disc storage section and said disc playback section; and
means for moving said at least one disc from said disc storage section into said disc transferring passage or from said disc transferring passage to said disc storage section by imparting rotational force to said at least one disc along the periphery thereof said disc moving means including means for traveling along an arcuate path substantially corresponding to the periphery of said predetermined disc.

4,567,585

OPTICAL TAPE RECORDER USING LINEAR SCANNING

Daniel Gelbart, 4616 Garden Grove Dr., Burnaby, B.C., Canada (V5G-3V3)

Filed Oct. 31, 1983, Ser. No. 547,329
Int. Cl.[4] G11B 7/00, 27/00
U.S. Cl. 369—97 4 Claims



1. An optical data recorder comprising:
a laser modulated according to incoming data;
a tape made of light sensitive material;
a slide constrained to move in a straight line reciprocally and transversly to said tape;
a mirror mounted on said slide onto which said modulated laser beam impinges;
a lens mounted on said slide to focus laser light reflected from said mirror into a small spot on said tape causing a permanent mark when said laser is turned on;
means for accurately measuring the position of said slide;
means for placing said marks on said tape in accordance with the measured position of said slide;
and means for moving said tape slowly in a direction transverse to motion of said slide.

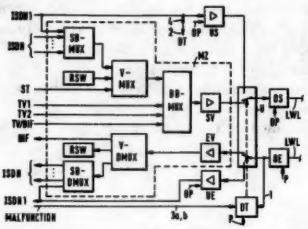
4,567,586

SERVICE INTEGRATED DIGITAL TRANSMISSION SYSTEM

Klaus Koeck, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,508
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045875
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—4 10 Claims

1. In a service integrated, time multiplex digital signal transmission system for transmitting narrowband and broadband signals between a central exchange terminal and a subscriber terminal, which system includes means defining a light conductor path connected between the terminals, a transmitter device at one terminal composed of sources of such narrowband and broadband signals and signal processing means conductively connected to the sources for receiving the signals provided by the sources and for combining the signals provided by the sources into a multiplex signal and for supplying such multiplex signal to the light conductor path, and a receiver device at the other terminal composed of signal processing means connected to the light conducting path for receiving multiplex signals from that path and separating the received multiplex signals into narrowband signals and broadband signals, the device at the subscriber terminal being normally supplied with operating power by local utility mains, a charge accumulator at the subscriber terminal conductively connected to the device at the subscriber terminal for supplying operating power thereto in the event of interruption of the power supply provided by the local mains, and means connected to the device at the one terminal for switching the system into an operating state in which the system effects signal transmission at a reduced bit rate in the event of such local mains power interruption, the improvement wherein:



one of said devices comprises emergency transmitting means for producing a narrowband signal and connected in signal conducting relation to the light conductor path for supplying such signal to the light conductor path;
the other of said devices comprises emergency receiving means for receiving the narrowband signal produced by said emergency transmitting means and connected in signal conducting relation to the light conductor path for receiving such signal from the light conductor path; and
said switching means comprise detector means located at one of the terminals for detecting a local mains power interruption, and switching members connected between said detector means and said device at said one terminal for responding to detection of such power interruption to deactivate said signal processing means at said one terminal and activate said emergency means at said one terminal.

4,567,587

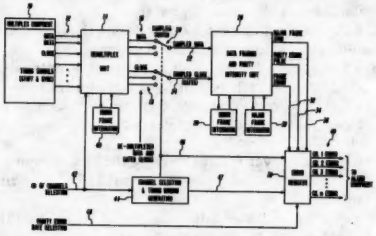
MULTIPLEX EQUIPMENT MONITORING APPARATUS

Thomas C. McDermott, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1983, Ser. No. 565,261
Int. Cl.[4] H04J 1/16, 3/06
U.S. Cl. 370—13 5 Claims

1. The method of checking for data transmission errors generated by high speed multiplexing equipment at a transmitter end of a communication system comprising the steps of:
demultiplexing a multiplexed data stream to regenerate time duration nonsymmetrical data along with nonsymmetrical associated clock timing signals both having irregular timing due to removal of overhead information bits from data stream;
detecting framing information from the regenerated data and

generating frame fault error signals when said framing information is not detected; and



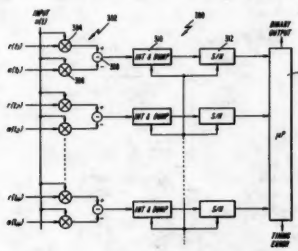
detecting parity of said regenerated data and generating parity error signals when indicated parity is not correct for a given channel of data.

4,567,588

SYNCHRONIZATION SYSTEM FOR USE IN DIRECT SEQUENCE SPREAD SPECTRUM SIGNAL RECEIVER

John W. Jerrim, Lilburn, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Mar. 23, 1984, Ser. No. 592,667
Int. Cl.[4] H04J *13/00*
U.S. Cl. 370—18 5 Claims



1. In a direct sequence spread spectrum code division multiplex system, including a plurality of transmitters synchronized to a common timing signal and each transmitting a data signal spread by a bipolar pseudo-random code which is a different assigned shift of a common bipolar sequence:

a receiver synchronized to said timing signal for receiving said transmitted signal spread by a bipolar pseudo-random code having a predetermined assigned code sequence shift, said receiver including a plurality of correlation detectors and means for applying to each of the correlation detectors (1) a first reference bipolar pseudo-random sequence that is a replica of the common bipolar pseudo-random sequence and has a code shift that is within one code chip of the assigned shift of a predetermined transmitter and is displaced from the common bipolar pseudo-random code sequence applied to the other correlation detectors by a fraction of a code chip less than unity, and (2) a second reference bipolar pseudo-random code that is a replica of the transmitted common bipolar pseudo-random code and has an unassigned code sequence shift, each of said correlation detectors including first means for obtaining the product of the transmitted sequences and the first reference bipolar pseudo-random sequences; second means for obtaining the product of the transmitted sequences and the second reference bipolar pseudo-random sequence and third means for obtaining a difference between the products obtained by the first and second means; synchronous integrator means for integrating the difference; means for synchronously sampling an output of the integrator means and signal processor means responsive to outputs of said correlation detectors to synchronize said receiver to said predetermined transmitter;

wherein each of said correlation detectors includes means for generating an in-phase correlation signal that is at a maximum and a quadrature-phase correlation signal that is at a minimum when said receiver and said predetermined transmitter are synchronized to each other:

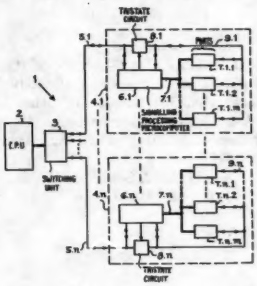
an improvement wherein said processor means includes means for measuring said in-phase and quadrature-phase correlation signals and further for obtaining an absolute value of the ratio of said in-phase and quadrature-phase correlation signals, and means for shifting receiver synchronization timing relative to said timing signal by a predetermined about depending upon the magnitude of said ratio to achieve synchronization with said predetermined transmitter.

4,567,589

ELECTRONIC DIGITAL PCM TIME-DIVISION EXCHANGE WITH DECENTRALIZED ARCHITECTURE

Daniel Lecomte, Paris, and Michel Gibaud, Herblay, both of France, assignors to Thomson CSF-Telephone, Paris, France

Filed Oct. 24, 1983, Ser. No. 545,009
Claims priority, application France, Oct. 26, 1982, 8217914
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 10 Claims



1. An electronic digital PCM time division exchange connecting subscribers to each other and to said exchange, comprising:

a central processing unit;

a switching network connected to said central processing unit; and

at least one rack connected to said switching network, each rack including:

a first PCM bidirectional junction connecting said rack to said switching network;

a tri-state circuit connected to said first PCM bidirectional junction;

at least one port card, each including at least one port adapted to connect subscribers to said exchange;

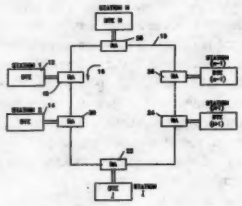
a second PCM bidirectional junction connecting said at least one port card to said tri-state circuit; and

a message processing microcontroller, connected to said at least one port card and to said tri-state circuit and to said first and second PCM bidirectional junctions.

4,567,590
MESSAGE STRIPPING PROTOCOL FOR A RING COMMUNICATION NETWORK

Seymour Bederman, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,789
Int. Cl.[4] H04J 3/16
U.S. Cl. 370—86 19 Claims



19. A method for stripping expended messages from a communications network comprising the steps of:

(a) transmitting from a first station a message including an identification label and a control indicia being set in a first state;

(b) receiving the message at a recipient station;

(c) stripping a portion of the message at the recipient station only if the identification label correlates with an identification characteristics of said recipient station;

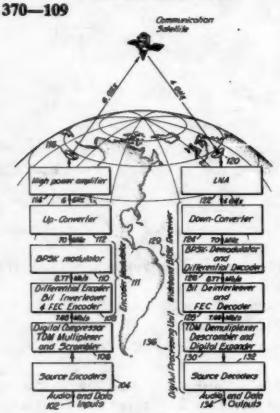
(d) receiving a remaining portion of the message at a second station; and

(e) stripping the remaining portion of said message only if the control indicia is set to a second state.

4,567,591
DIGITAL AUDIO SATELLITE TRANSMISSION SYSTEM

James S. Gray, 4718 Pine Acres Ct., Dunwoody, Ga. 30338; James W. Chamberlin, 368 Omega Dr.; Alan L. McBride, 2974 Moore Ave., both of, Lawrenceville, Ga. 30245, and Peter G. Schreiner, III, 1281 Brockett Rd., Apartment 23D, Clarkston, Ga. 30021

Filed Aug. 1, 1983, Ser. No. 519,268
Int. Cl.[4] H04J 3/00
U.S. Cl. 370—109 15 Claims



1. A system for processing analog audio and digital data signals and modulating an intermediate frequency carrier for subsequent conversion to a transmission frequency, amplification and transmission comprising:

(1) a source encoder for converting the analog audio portions of said signals to digital form;

(2) a digital compressor for compressing the digitized analog audio signals to reduce their data rates;

(3) a multiplexer for combining into a single data stream the compressed signals output by the compressor;

(4) a forward error correction encoder for encoding the data stream output by the multiplexer utilizing a convolutional self orthogonal code;

(5) a bit interleaver for interleaving the bits contained in the data stream output by the forward error correction encoder;

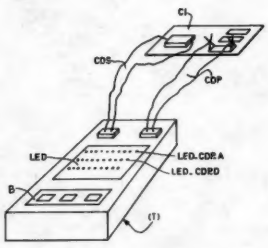
(6) a differential encoder for differentially encoding the data stream output by the bit interleaver; and

(7) a binary phase shift key modulator for modulating the data stream output by the differential encoder at an intermediate frequency.

4,567,592
METHOD AND APPARATUS FOR THE STEPWISE STATIC TESTING OF THE RESPECTIVE CONNECTIONS AND INTEGRATED SUBSYSTEMS OF A MICROPROCESSOR-BASED SYSTEM FOR USE BY THE GENERAL PUBLIC

Jean Minicilli, Torcy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,378
Claims priority, application France, Sep. 8, 1982, 82 15235
Int. Cl.[4] G01R 31/28; G06F 11/00
U.S. Cl. 371—20 6 Claims



1. A method for testing a microprocessor-based system in case of a malfunction in said system, said system having a data bus with a first plurality of bit lines in parallel, an address bus with a second plurality of bit lines in parallel, and a third plurality of control bit lines for interconnecting said microprocessor with respective peripheral circuits (ROM, RAM) thereof, said method comprising the steps of:

(a) verifying whether a significant general power supply level for said system is present;

(b) verifying the presence of a correct clock signal for said system as provided by a clock signal procurement means;

(c) replacing the system microprocessor by another, non-defective, microprocessor of the same type to determine whether the original system microprocessor is defective; and

in case of a sufficient general supply level and a correct clock signal and the presence of said non-defective microprocessor, said system is still malfunctioning, the following steps are executed:

(d) removing the non-defective microprocessor while steering all said peripheral circuits to their high-impedance output states with respect to respective ones of said first, second, and third pluralities of bit lines connected to said peripheral circuits;

(e) feeding said first, second and third pluralities of bit lines with a sequence of quasi-static signal patterns for imple-

menting the following steps for testing a predetermined peripheral circuit interconnection;

(f) applying a sequence of binary signals to each bit line associated to said peripheral circuit and verifying the presence of said binary signal on the corresponding package input of said peripheral circuit;

(g) verifying of the absence of short circuits between the various bit lines and/or between a line and the power supply by applying a binary signal of high level via a single bus line and a binary signal of low level via all other bus lines, and verifying that said binary signal of high level does not arrive on a bus line other than the line on which it has been dispatched, followed by the successive application of said binary high signal via all other bus lines in order to perform the same verification as before by simple permutation of signal values;

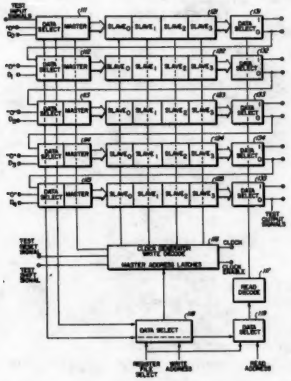
(h) verifying of the absence of short circuits between the various bus lines and/or between a line and ground by dispatching a binary signal of low level (connected to ground) via a single bus line and a binary signal of high level via all other bus lines, and verifying that said other than the line on which it has been dispatched, followed by the successive application of said binary signal of low level on all other bus lines in order to perform the same verification as before by simple permutation of signal values.

4,567,593

APPARATUS FOR VERIFICATION OF A SIGNAL TRANSFER IN A PRESELECTED PATH IN A DATA PROCESSING SYSTEM

Lawrence D. Bashaw, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 6, 1983, Ser. No. 539,356
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—25 **3 Claims**



1. Apparatus for verifying the operation of a data processing system, comprising:

(a) maintenance means, having a maintenance processor and a maintenance memory, for controlling the execution of a test operation of the data processing system;

(b) coupling means for coupling the maintenance processor to the data processing system;

(c) test control means, operatively connected to said coupling means, for controlling the distribution of an input test signal, the distribution of a plurality of control signals, and the distribution of a clock signal to said data processing system; and

(d) register means, operatively connected to said test control means, said register means being associated with the data processing system, said register means including:

(i) at least one register of a master/slave type having at least one register position, the register having data select logic before a master latch associated with said register which can select normal input, configure the register as a shifting register, or reset the register in response to one of said control signals; or

(ii) at least one register file having a plurality of registers of at least one register position, and further having a master latch, a slave register, and a data selector for each of the plurality of registers, the data selector selecting a normal input mode, a shifting mode, or a reset mode in response to one of said control signals;

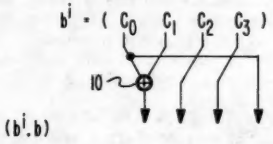
preselected register means being placed in the shifting mode in response to one of said control signals, the input test signal being shifted through the preselected register means in response to a shift control signal, the input test signal being analyzed by the maintenance processor after the input test signal has been shifted through the preselected register means to determine if the input test signal has an expected result, the shifting configuration of said register means providing for inversion between each register position wherein each bit of the input test signal is inverted as it is shifted, thereby permitting the analysis to identify a shift path failure.

4,567,594

REED-SOLOMON ERROR DETECTING AND CORRECTING SYSTEM EMPLOYING PIPELINED PROCESSORS

Shirish P. Deodhar, Canoga Park, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 7, 1983, Ser. No. 502,046
Int. Cl.[4] G06F *11/12*
U.S. Cl. 371—38 **12 Claims**



1. In a disk storage system, a machine implemented method for providing error detection and correction of digital data read from said disk, said method comprising:

providing a disk having a track wherein the track is in turn divided into a plurality of sectors and wherein data is recorded in each sector as a plurality of interleaved code words along with check data having values determined in accordance with Reed-Solomon decoding principles;

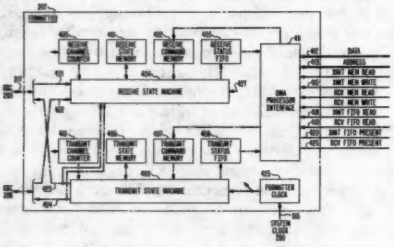
sequentially reading sectors of data from said disk; and

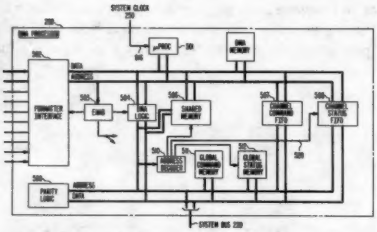
detecting and correcting errors in sectors of data read from said disk by consecutively performing a sequence of processing steps chosen in accordance with said Reed-Solomon decoding principles, wherein each step is performed by a separate processor, and wherein these processors perform said steps in a pipelined manner with respect to sequentially read sectors and at a rate which provides essentially real-time correction of data errors in sectors read from said disk.

4,567,595
MULTILINE ERROR DETECTION CIRCUIT

Kurt A. Hedlund, Chicago, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1983, Ser. No. 481,058
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—49 12 Claims





1. In a data transmission system having a plurality of transmitting units with associated serial transmission links and central control means for sequentially selecting one of said transmitting units to serially transmit data signals to said central control means via one of said associated transmission links and other ones of said units only transmitting data signals of an idle data type, an arrangement for the detection of the transmission of data signals other than said idle data type by any of said other ones of said transmitting units comprising

means for selecting serial data signals from said selected one of said transmitting units via said one of said associated transmission links;

means responsive to all data signals transmitted from all of said transmitting units via all of said transmission links for generating error check signals of a first error type upon said selected serial data signals being idle data type and another error type upon said selected serial data signals being of non-idle data type; and

means responsive to said error check signals not being equal to predefined bit signals for generating an error occurrence signal.

4,567,596
LASER APPARATUS

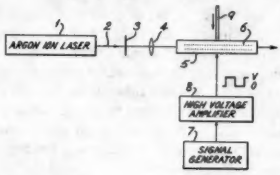
Amyand D. Buckingham, Cambridge, England, and David P. Shelton, Toronto, Canada, assignors to National Research Development Corporation, London, England

Filed Jun. 18, 1982, Ser. No. 390,117
Claims priority, application United Kingdom, Jul. 2, 1981, 8120441
Int. Cl.[3] H01S *3/10*
U.S. Cl. 372—22 7 Claims

1. A laser apparatus including:

means for enabling a beam of coherent electromagnetic radiation to be propagated along a path; and

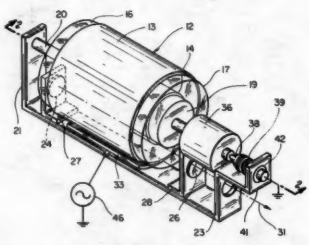
electric field directing means for applying a plurality of directional electric fields across the path, the fields being spaced apart in sequence along the path and successive fields being directed oppositely, said electric field directing means comprising a plurality of pairs of electrodes positioned on opposite sides of the path and means for applying electric potential difference between the electrodes of a pair, the spacing between the fields being such that at a predetermined speed of propagation of the radiation a predetermined harmonic frequency of the radiation is enhanced.



4,567,597
HIGH POWER LASER SYSTEM

Michael J. Mandella, 460-B Tyrella Ave., Mountain View, Calif. 94043

Filed Oct. 15, 1982, Ser. No. 434,491
Int. Cl.[4] H01S *3/04*
U.S. Cl. 372—34 13 Claims



1. A high power laser comprising

an annular lasing medium contained within an envelope having transparent end walls

means defining a resonant region in an active portion of said annular lasing medium between said transparent end walls

means for exciting said active portion of said resonant region of said annular lasing medium and for generating a population inversion in said active portion of said resonant region;

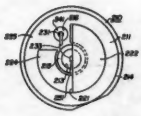
means for rotating said annular lasing medium such that a non-excited or cooled portion of sad lasing medium is rotated into said resonant region and said excited active portion of said excited lasing medium is rotated out of said resonant region to transfer heat generated during excitation of said active portion of said lasing medium to the surrounds.

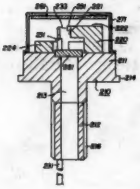
4,567,598

OPTOELECTRONIC SEMICONDUCTOR DEVICES IN HERMETICALLY SEALED PACKAGES

Shozo Noguchi; Yasunobu Oshima, and Tohru Kamata, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,316
Claims priority, application Japan, Feb. 23, 1982, 57-27603
Int. Cl.[4] H01S 3/04; H01L 23/36
U.S. Cl. 372—36 6 Claims





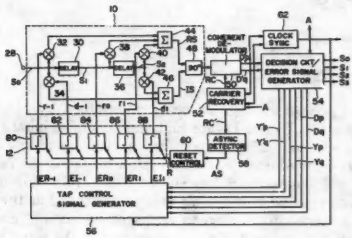
1. Optoelectronic semiconductor apparatus comprising:
an optoelectronic semiconductor device having a pair of electrodes;
a circular stud for providing an electric connection to one electrode of said device, said stud having a coaxial hole to pass light propagated to or from said device;
a transparent window provided on said circular stud to cover said coaxial hole;
a lead penetrating said stud adjacent said window for providing an electric connection to the other electrode of said device;
an insulating means for electrically insulating said lead from said stud, said insulating means maintaining hermetic sealing for said lead and stud;
a mounting block secured onto said stud and having a thermal expansion coefficiency different from that of said stud, said block having a C-shaped portion in contact with said stud such that said C-shaped portion surrounds said transparent window in a plan view except for a gap and said lead is positioned in the gap of said C-shaped portion, said block further including a protruding portion extending from said C-shaped portion in a direction away from said stud, said protruding portion being electrically and thermally attached to said device and being positioned to provide light propagation to or from said device in a direction axially of said stud, said C-shaped portion having inner and outer edges substantially coaxial to said circular stud; and
a cap with a window substantially transparent to light directed to or from said device, said cap being secured to said stud to form a sealed enclosure for said device.

4,567,599

AUTOMATIC ADAPTIVE EQUALIZER HAVING IMPROVED RESET FUNCTION

Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,602
Claims priority, application Japan, Oct. 1, 1982, 57-173653
Int. Cl.[4] H04L 25/03, 7/04; H03K 5/135
U.S. Cl. 375—14 8 Claims



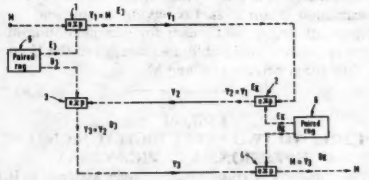
1. An automatic adaptive equalizer comprising:
an equalizer for equalizing an incoming signal in response to a control signal;
a demodulator;
an asynchronism detector for detecting asynchronism in said demodulator;
a control loop for producing said control signal according to the output of said equalizer, said control loop including a tap control signal generator and a plurality of resettable integrators;
a reset control circuit provided between said asynchronism detector and said plurality of resettable integrators, and responsive to the output of said asynchronism detector for intermittently issuing a reset signal which is applied to said plurality of resettable integrators.

4,567,600

METHOD AND APPARATUS FOR MAINTAINING THE PRIVACY OF DIGITAL MESSAGES CONVEYED BY PUBLIC TRANSMISSION

James L. Massey, Zurich, Switzerland, and Jimmy K. Omura, Culver City, Calif., assignors to Omnet Associates, Sunnyvale, Calif.

Filed Sep. 14, 1982, Ser. No. 418,038
Claims priority, application European Pat. Off., Feb. 2, 1982, 82100739.0
Int. Cl.[4] H04L 9/04
U.S. Cl. 375—2.1 26 Claims


Paired ring
Paired ring
OPERATIONS BY USER 1 WHO ORIGINATES THE MESSAGE M
TRANSMISSIONS OVER PUBLIC CHANNELS
OPERATIONS BY USER 2 WHO RECEIVES M

23. The method for maintaining the privacy of a digital message M conveyed by public transmission between a sender and a receiver wherein private transmission of said digital message M requires the actual transmission of a first public digital message Y_1, a second public digital message Y_2 and a

third public digital message Y_3 for each private digital message M over public transmission means, said private digital message M and said three public digital messages Y_1, Y_2 and Y_3 each represented by a vector of m binary digits where m is an integer equal to or greater than 2, and each normal basis representations of an element of the finite field $GF(2^m)$ containing 2^m elements other than the elements 0 and 1 of said finite field, said three public messages Y_1, Y_2 and Y_3 being the elements of $GF(2^m)$ determined by the equations

$$Y_1 = M^{E1}$$

$$Y_2 = Y_1^{E2}$$

$$Y_3 = Y_2^{D1}$$

and said private message M being determined by $M = Y_3^{D2}$, where E_1, D_1, E_2 and D_2 are each integers of m binary digits between 1 and 2^m-2 inclusive whose products $E_1D_1 = E_2D_2 = 1$ modulo 2^m-1, said first public message Y_1 being transmitted from said sending station to said receiving station, said second public message Y_2 being transmitted as the reply from said receiving station to said sending station, and said third public message Y_3 being transmitted as the reply to said message Y_2 from said sending station to said receiving station, said receiving station then calculating said private message M according to the equation $M = Y_3^{D2}$, comprising the steps of:

(a) generating in random integer generating means at said sending station a first random integer of m binary digits;

(b) computing in means for computing at said sending station a pair of integers E_1 and D_1 each between 1 and 2^m-2 inclusive, and each of m binary digits such that their product E_1D_1 equals 1 modulo 2^m-1 when presented with said first random integer;

(c) exponentiating in means for exponentiating at said sending station said private message M to the E_1 power to obtain said public message Y_1;

(d) transmitting said message Y_1 over said public transmission means to said receiving station;

(e) generating in random integer generating means at said receiving station a second random integer of m binary digits;

(f) computing in means for computing at said receiving station a pair of integers E_2 and D_2 each between 1 and 2^m-2 inclusive and each of m binary digits such that their product E_2D_2 equals 1 modulo 2^m-1 when presented with said second random integer;

(g) exponentiating in means for exponentiating at said receiving station said public message Y_1 to the E_2 power to obtain said public message Y_2;

(h) transmitting said message Y_2 over said public transmission means to said sending station;

(i) exponentiating in said means for exponentiating at said sending station said public message Y_2 to the D_1 power to obtain said public message Y_3;

(j) transmitting said public message Y_3 over said public transmission means to said receiving station; and

(k) exponentiating in said means for exponentiating at said receiving station said public message Y_3 to the D_2 power to obtain said private message M.

4,567,601

THREE-TO-TWO LEVEL DIGITAL SIGNAL CONVERSIONS AND VICE VERSA

Peter J. Mountain, The Hague, Netherlands, assignor to British Telecommunications, London, England

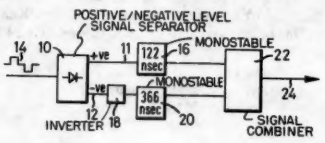
Filed Jul. 18, 1983, Ser. No. 514,956

Claims priority, application United Kingdom, Jul. 19, 1982, 8220836

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 375—22 **6 Claims**

1. A method of converting a three level signal for transmission through a bi-level digital device comprising separating the opposite polarity parts of the three level signal and inverting one part, converting one said part to pulses having a first pulse length and converting the other said part to pulses having a second pulse length which is different from said first pulse



length, combining and transmitting said pulses through the digital device and decoding said pulses to regenerate the three level signal.

4,567,602

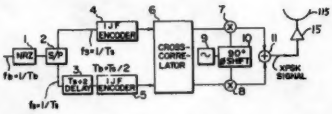
CORRELATED SIGNAL PROCESSOR

Shuzo Kato, Yokohama, Japan, and Kamilo Feher, Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jun. 13, 1983, Ser. No. 503,574

Int. Cl.⁴ H03K *1/02*; H04L *27/20*

U.S. Cl. 375—60 **14 Claims**



1. A cross-corrected signal processor comprising:

(a) means for providing in-phase and quadrature phase shifted NRZ digital input signals,

(b) means for cross-correlating each two symbols of the in-phase signal with each two symbols of the quadrature signal, every half symbol and providing in-phase and quadrature phase shifted intersymbol-interference and jitter free (IJF) encoded output signals having amplitudes modified from the peak amplitudes of IJF encoded signals according to the following schedule:

(i) when the in-phase channel signal is zero, the quadrature shifted signal is the maximum IJF amplitude according to its wave shape,

(ii) when the in-phase channel signal is non-zero, the maximum magnitude of the quadrature shifted signal is reduced from 1 normalized to A, where

$$\frac{1}{\sqrt{2}} \leqq A \leqq 1,$$

(iii) when the quadrature channel signal is zero, the in-phase signal is the maximum IJF amplitude according to its wave shape,

(iv) when the quadrature channel signal is non-zero, the in-phase signal is reduced from 1 (normalized) to A, where

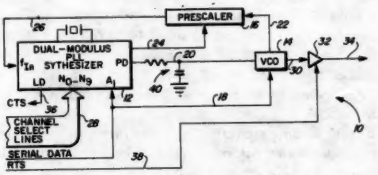
$$\frac{1}{\sqrt{2}} \leqq A \leqq 1,$$

(c) and means for quadrature modulating the in-phase and quadrature output signals, to provide a cross-correlated modulated output signal.

4,567,603
FSK MODULATOR AND METHOD FOR NRZ DATA TRANSMISSION UTILIZING PLL FREQUENCY SYNTHESIS

William J. Howell, Tempe, and John D. Hatchett, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 9, 1983, Ser. No. 502,778
Int. Cl.[4] H03C 3/06
U.S. Cl. 375—65 10 Claims



1. A frequency generator for providing an FSK modulated RF signal comprising:

a PLL frequency synthesizer having frequency and divide inputs thereto and a phase detector output thereof;

a VCO having error and modulation inputs thereto, said error input being connected to said phase detector output of said PLL frequency synthesizer and an output thereof being coupled to said frequency input of said PLL frequency synthesizer; and

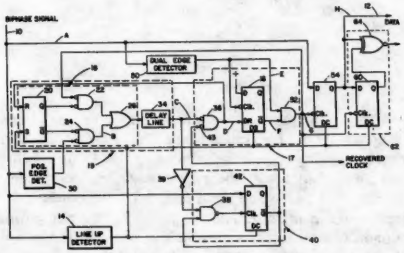
means connected to said PLL frequency synthesizer for directly applying a serial data stream to said divide input of said PLL frequency synthesizer and said modulation input of said VCO

whereby said FSK modulated RF signal is provided at said output of said VCO in response to said serial data stream.

4,567,604
BIPHASE SIGNAL RECEIVER

Barry H. Jacksier, Wheeling, Ill., assignor to AT&T Teletype Corporation, Skokie, Ill.

Filed Aug. 29, 1983, Ser. No. 526,940
Int. Cl.[4] H04L 27/22
U.S. Cl. 375—87 5 Claims



1. A receiver for generating digital output signals in response to received messages encoded in a biphase signal coding format, each message comprising a spacing portion, a preamble portion and a data portion, the receiver comprising:

an input terminal (10) for accepting an incoming message,

a first detection means (19) responsive to said incoming message signal for generating a first control signal,

a second detection means (40) responsive to said first control signal and said preamble portion of said incoming message signal for generating a second control signal,

means (17) connected to said input terminal and first (10) and second (40) detection means for generating a third control signal in response to said first and second control signals and for generating a sampling signal in response to said first and second control signals and voltage level transitions of said message signal,

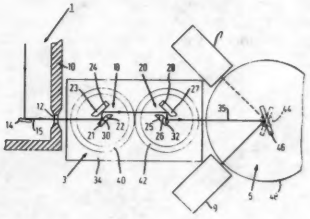
said first detection means (19) including a switch (18) responsive to said third control signal for switching the generation of said first control signal from response to said incoming message signal to response of said sampling signal, and

means connected to said input terminal (10) and said sampling means (17) for generating digital output signals in response to said sampling signal and said message signal.

4,567,605
X-RAY ANALYSIS APPARATUS COMPRISING A FOUR-CRYSTAL MONOCHROMATOR

Willem J. Bartels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,274
Claims priority, application Netherlands, Nov. 25, 1982, 8204584
Int. Cl.[4] G01N 23/20
U.S. Cl. 378—85 11 Claims



1. In an X-ray analysis apparatus comprising in order an X-ray source providing an X-ray beam, a monochromator, a specimen holder, and detecting means for detecting X-rays from a specimen on said specimen holder, the improvement comprising said monochromator including

four crystal faces positioned as pairs of crystal faces, said faces of each pair being parallel to one another, and said faces being arranged so that an emergent X-ray beam is colinear to an incident X-ray beam,

wherein said pairs are rotatably in a coupled manner to change Bragg angle while maintaining collinearity.

4,567,606
DATA PROCESSING APPARATUS AND METHOD FOR USE IN SPEECH RECOGNITION

George Vensko, Ramona; Lawrence Carlin, San Diego; John Potter, Ramona, and Allen R. Smith, Poway, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

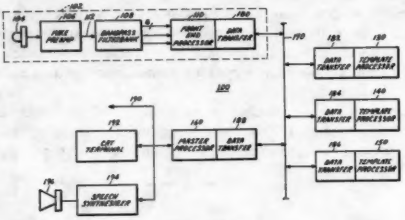
Filed Nov. 3, 1982, Ser. No. 439,018
Int. Cl.[4] G10L 1/00
U.S. Cl. 381—43 10 Claims

1. A distributed processing apparatus for performing a continuous speech recognition function comprising:

a plurality of processing means coupled by a remote bus and each having a shared memory associated therewith and each for performing local processing on data stored in said associated shared memory; and

data transfer means associated with each of said processing means and with said associated shared memory and coupled thereto for transferring at least a portion of said data between said shared memories across said remote bus;

direct memory access circuit means (DMA) for preventing interference with local processing of the remaining portions of said data by said plurality of processing means during said transfer of data.



4,567,607

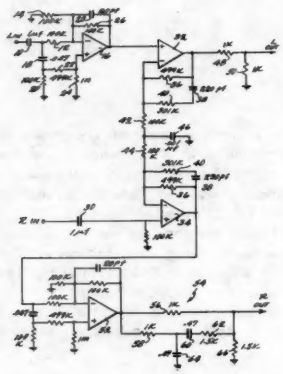
STEREO IMAGE RECOVERY

Paul F. Bruney, Silver Spring, and Robert S. Bugash, Wheaton, both of Md., assignors to Stereo Concepts, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 491,297, May 3, 1983, Pat. No. 4,495,637, which is a continuation-in-part of Ser. No. 401,211, Jul. 23, 1982, abandoned. This application Nov. 22, 1983, Ser. No. 554,385

Int. Cl.⁴ H04R *5/00*

U.S. Cl. 381—1 **43 Claims**



1. An audio signal processing circuit for processing plural channels of related audio signals, said circuit comprising:

a first audio signal processing channel;

a second audio signal processing channel;

cross-feed means for feeding signal levels from the first to second channel and from the second to first channel in an out-of-phase, phase difference relationship with respect to related audio signals already passing through a given channel, said relationship of phase difference versus frequency having not more than one frequency wherein phrase differences for frequencies directly adjacent said one frequency are less than the phase difference at said one frequency; and

means for limiting said cross-feeding to components of said signal levels below a predetermined frequency;

said first channel including first means for reversing the phase of low frequency signals with respect to high frequency signals, said first reversing means processing signals before said cross-feed means;

one of said first and second channels including second means for reversing the phase of low frequency signals with respect to high frequency signals, said second reversing means processing signals after said cross-feed means.

40. A method of processing plural channels of related audio signals comprising the steps of:

first reversing the phase of low frequency components of one of said audio signals with respect to high frequency components;

after said first reversing step, feeding signal levels from a first channel receiving the output of said reversing step to a second channel receiving another of said audio signals and from said second channel to said first channel and combining the cross-fed signal components in an out-of-phase, phase difference relationship with respect to related audio signals already passing through a given channel; and

after said feeding step, reversing the phase of low frequency components of signals from said second channel with respect to high frequency components.

4,567,608

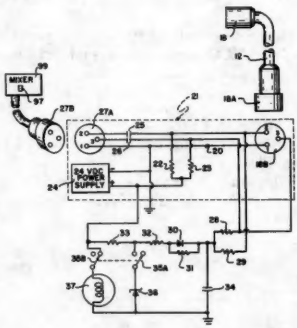
MICROPHONE FOR USE ON LOCATION

Alan R. Watson, Niles, and John P. Overley, Buchanan, both of Mich., assignors to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Mar. 23, 1984, Ser. No. 592,411

Int. Cl.⁴ H04R *3/00*

U.S. Cl. 381—122 **8 Claims**



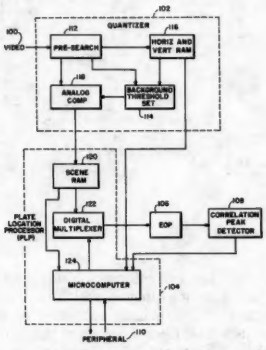
1. A device for connecting a microphone to a microphone cable system, the cable system being adapted to conduct audio signals and having at least two conductors and a direct current source connected across the two conductors, comprising an audio amplifier having an input adapted to be coupled to the microphone and an output, said amplifier having two terminals for connection to a direct current source of power, coupling means connected to the output of the amplifier and adapted to be connected to the microphone cable system for coupling audio signals from the amplifier to the microphone cable system, said coupling means isolating the direct current power of the microphone cable system from the output of the amplifier and including a diode connected to one of the amplifier power input terminals, said diode being connected to pass current from the microphone cable system to said amplifier to power the amplifier, a light emitting diode and a zener diode connected in series across the power input terminals of the amplifier, the zener diode being polarized against the flow of current to the light emitting diode and having a breakdown potential below the potential of the direct current source of the microphone cable system.

4,567,609

AUTOMATIC CHARACTER RECOGNITION SYSTEM

Travis W. Metcalf, Lemon Grove, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 28, 1983, Ser. No. 479,372
Int. Cl.[4] G06K 9/34
U.S. Cl. 382—9 45 Claims



AUTOMATIC CHARACTER RECOGNITION SYSTEM BLOCK DIAGRAM

1. An apparatus for automatic location and recognition of alphanumeric characters in a bounded area of known size within a scene viewed by a raster-scan type video sensor which comprises:

means, connected to receive a video signal from the raster-scanned type sensor, for converting said video signal into a digital binary signal whereby the alphanumeric characters are represented by one of the binary signals and the background data is represented by the other binary signal;

means, disposed to receive the output of the converting means, for locating a known bounded area containing alphanumeric characters in the scene viewed;

means, connected to the locating means, for recognizing the alphanumeric characters contained in the known bounded area; and

means, disposed to receive the output of the recognizing means, for further processing and displaying of the recognized alphanumeric characters;

wherein the converting means comprises:

means, disposed to receive the analog video signal from the video sensor, for presearching the scene viewed to locate probable bounded areas containing alphanumeric characters, wherein said means for presearching identifies horizontal and vertical coordinates representing the location of each probable bounded area containing alphanumeric characters;

means, connected to receive a signal from the output of the presearching means, for setting a threshold to represent the background signal level;

means, connected to the presearching means, for storing the horizontal and vertical coordinates representing the location of each probable bounded area containing alphanumeric characters; and

means, connected to receive the analog video signal from the video sensor and also connected to receive the output analog signal from the threshold setting means, for digitizing those signals pertaining to probable bounded areas containing alphanumeric characters in a manner that signals pertaining to alphanumeric characters are set as a first binary coded signal level and the background signals are set at the second binary coded signal level;

the apparatus further comprising:

a threshold setting means which adjusts the threshold reference signal to relate in an absolute manner to analog signals pertaining to probable alphanumeric characters in a manner that possible alphanumeric characters are always treated similarly in relation to the background level whether the alphanumeric characters are light colored on a dark background or dark colored on a light background; and

an analog comparator as the digitizing means, said analog comparator outputting a digital logic binary signal of "1" for data pertaining to alphanumeric characters and a digital logic signal of "0" for data caused by background signals;

wherein the presearching means comprises:

an input for receiving the video signals from the video sensor;

a bit clock generator;

a first analog delay circuit connected to receive the video sensor input, said delay circuit causing a delay of time length equal to one horizontal video line scan;

a first analog differential comparator which receives input signals from the first analog delay circuit and from the video sensor input, said comparator outputting a signal when the input signals differ;

a first AND gate which receives one input from the bit clock generator and a second input from the output of the first analog differential comparator, said AND gate emitting an output signal when signals occur simultaneously at both inputs;

a first counter connected to receive the output of the first AND gate, said counter accumulating a total count representing the period during which the first AND gate is outputting a pulse signal;

a first digital comparator connected to receive the count output (A) from the first counter and to compare this accumulating count against a preset test count (B) which represents the expected horizontal width of a single alphanumeric character, said comparator outputting a signal when A is less than or equal to B;

a first D-flip flop unit connected to receive the output signal from the first digital comparator, said flip flop unit outputs a signal after it has been triggered by a first output signal from the first digital converter;

a second D-flip flop unit connected to receive the output of the first D-flip flop unit and to receive the output signals from the first digital comparator, said second D-flip flop unit being activated by the output signal from the first D-flip flop unit which occurs when the first flip flop unit is activated by the first output signal emitted from the first comparator, and then is caused to emit a signal at its output when a second consecutive signal is emitted from the first comparator;

a second counter connected to receive inputs from the bit clock generator which causes the counter to accumulate counts;

a second digital comparator connected to receive the count output (C) from the second counter, and to compare this accumulating count against a preset test count (D) which represents the expected horizontal width of the area containing all alphanumeric characters of interest, said comparator outputting a signal when C is greater than or equal to D;

a second AND gate which receives inputs from the second digital comparator and the second D-flip flop unit, said AND gate emitting an output signal when its input's both simultaneously hold an input signal, whereby the tentative detection of a field of alphanumeric characters of interest against a clear background has been accomplished;

a second analog delay circuit connected to receive the output of the first analog delay circuit, said second circuit causing a delay of time length equal to 10 bits along a horizontal video line scan;

a second analog differential comparator connected to receive the output of the second analog delay circuit and the output of the first analog delay circuit, said second analog

differential comparator outputting a signal when its input signals differ, said second differential comparator being connected to feed this output signal to the second counter and the first and second D-flip flop units whereby these respective devices are reset to restart their active functions over;

a first OR gate connected to receive the output signals from the first and second analog differential comparators, said OR gate emitting a signal when either of the signals input from said first and second comparators exist, and said output of the OR gate connected to the first counter whereby this counter is reset to the start position when a signal from the OR gate output occurs; and

a third analog delay circuit connected to receive the output video signal from said first analog delay circuit, said third delay circuit causing a delay of time length equal to one horizontal video line scan.

4,567,610

METHOD OF AND APPARATUS FOR PATTERN RECOGNITION

Robert K. McConnell, Arlington, Mass., assignor to Wayland Research Inc., Wayland, Mass.

Filed Jul. 22, 1982, Ser. No. 400,948

Int. Cl.[4] G06K *9/80*

U.S. Cl. 382—18 **52 Claims**

1. A method of recognizing a pattern in a test object, said method comprising the steps of:

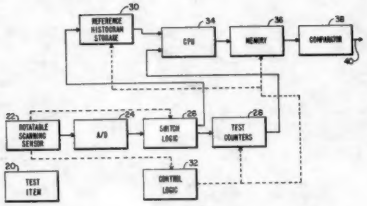
specifying properties characteristic of said pattern;

specifying discrete ranges of values of said properties;

measuring the values of said properties in said test object;

arranging the measured values in at least one test histogram;

determining a reference set of values of said properties and arranging said set as at least a first reference histogram; and

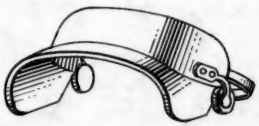


comparing said test and reference histograms by determination of the value of a function which provides a measure of the amount of information necessary to express said at least one test histogram in terms of the optimum code for describing at least said first reference histogram.

DESIGNS

JANUARY 28, 1986

282,308
COMBINED EYE SHADE AND EAR PROTECTOR
John W. Kain, 1976 Cambridge Dr., Crofton, Md. 21114
Filed Aug. 23, 1983, Ser. No. 525,684
Term of patent 14 years
U.S. Cl. D2—247

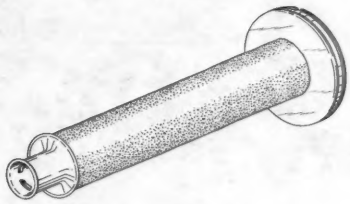


282,309
LADYBIRD BOOT
Peter Valori, London, England, assignor to Button Fronts (London) Limited, London, England
Filed Dec. 12, 1983, Ser. No. 560,175
Claims priority, application United Kingdom, Jun. 10, 1983, 1013499
Term of patent 14 years
U.S. Cl. D2—273

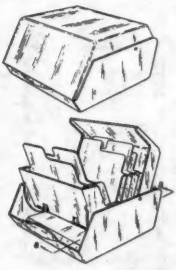
282,310
BOOT
Peter Valori, London, England, assignor to Button Fronts (London) Ltd., London, England
Filed Aug. 26, 1983, Ser. No. 526,875
Term of patent 14 years
U.S. Cl. D2—273

282,311
CUFF LINK OR SIMILAR ARTICLE
John R. Parks, and Thomas W. Tozzer, both of 3696 Sunnyside Dr., Riverside, Calif. 92506
Filed Apr. 11, 1984, Ser. No. 483,639
Term of patent 14 years
U.S. Cl. D2—417

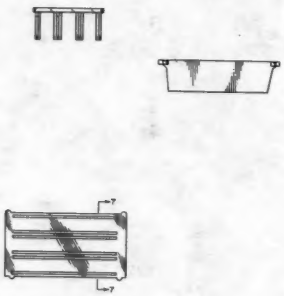
282,312
YARN BOBBIN
H. Wayne Dick, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jul. 18, 1983, Ser. No. 514,405
Term of patent 14 years
U.S. Cl. D3—24



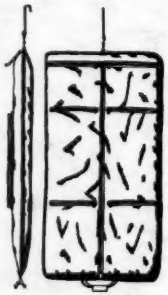
282,313
DISKETTE STORAGE CONTAINER
Jerry M. Long, Scotts Valley, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed Feb. 3, 1983, Ser. No. 445,088
Term of patent 14 years
U.S. Cl. D3—35



282,314
HOLDER FOR CASSETTE TAPES
Fred O. Hoese, Rte. 3, Box 3350, Bulverde, Tex. 78163
Filed Jul. 28, 1983, Ser. No. 517,909
Term of patent 14 years
U.S. Cl. D3—35



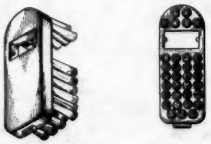
282,315
EXPANDABLE BAG
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Division of Ser. No. 365,082, Apr. 2, 1982, abandoned, Continuation-in-part of Ser. No. 172,478, Jul. 25, 1980, abandoned. This application Apr. 6, 1983, Ser. No. 482,456
Term of patent 14 years
U.S. Cl. D3—71



282,316
BRUSH HOLDER
Ronald Herzfeld, Kirchenstrasse 65, D-8034 Germering (BRD), Fed. Rep. of Germany
Filed Aug. 2, 1983, Ser. No. 519,632
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 13 405; Apr. 1, 1983, 13 407
Term of patent 14 years
U.S. Cl. D4—104

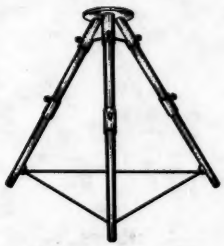
282,317
BRUSH AND HOLDER
Ronald Herzfeld, Kirchenstrasse 65, D-8034 Germering (BRD), Fed. Rep. of Germany
Filed Aug. 2, 1983, Ser. No. 519,633
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 13 405; Apr. 1, 1983, 13 407
Term of patent 14 years
U.S. Cl. D4—104

282,318
BRUSH
Ronald Herzfeld, Kirchenstrasse 65, D-8034 Germering (BRD), Fed. Rep. of Germany
Filed Aug. 2, 1983, Ser. No. 519,638
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 13 405; Apr. 1, 1983, 13 407
Term of patent 14 years
U.S. Cl. D4—104

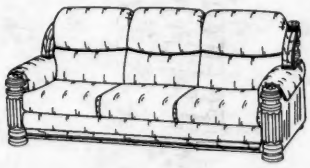


282,319
BRUSH ASSEMBLY
Ronald Herzfeld, Kirchenstrasse 65, D-8034 Germering (BRD), Fed. Rep. of Germany
Filed Aug. 2, 1983, Ser. No. 519,637
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 13 405; Apr. 1, 1983, 13 407
Term of patent 14 years
U.S. Cl. D4—115

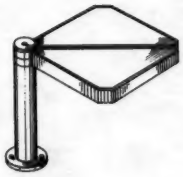
282,320
EXTENDABLE TRIPOD UNIT
Charles Anderson, P.O. Box 53, Potter Valley, Calif. 95469
Filed Mar. 14, 1983, Ser. No. 475,131
Term of patent 14 years
U.S. Cl. D6—300



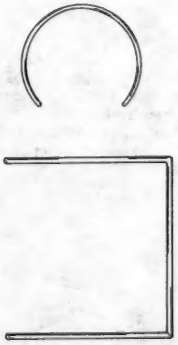
282,321
SEAT
Carol Christa, and Patrick Waldron, both of Dunwoody, Ga., assignors to The Bean Station Furniture Factory, Bean Station, Tenn.
Filed Jul. 25, 1983, Ser. No. 516,717
Term of patent 14 years
U.S. Cl. D6—381



282,322
EXTENDIBLE PEDESTAL TABLE
Fredrick Lambiase, 467 Terrace Ave., Hasbrouck Hts., N.J. 07604
Filed Aug. 8, 1983, Ser. No. 521,378
Term of patent 14 years
U.S. Cl. D6—430

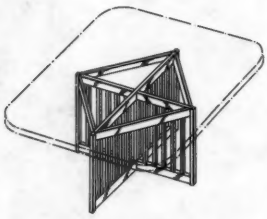


282,323
PAN LID HOLDER
Lowell L. Fetty, 4603 S. Route 47, Woodstock, Ill. 60098
Division of Ser. No. 380,529, May 21, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,778
Term of patent 14 years
U.S. Cl. D6—462



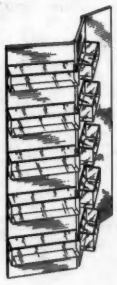
282,324
BOOKSTAND
Kenneth A. Ellis, R.R. 1, Evansville, Wis. 53536
Filed Jul. 13, 1983, Ser. No. 513,345
Term of patent 14 years
U.S. Cl. D6—475

282,325
TABLE BASE
Richard Meier, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Filed Sep. 15, 1982, Ser. No. 418,477
Term of patent 14 years
U.S. Cl. D6—495



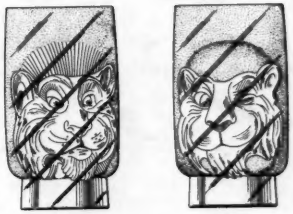
282,326
MERCHANDISE DISPLAY RACK
Ted A. Bell, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Apr. 26, 1983, Ser. No. 488,772
Term of patent 14 years
U.S. Cl. D6—566

282,327
STORAGE UNIT
Paul J. Neff, 1143 Mississauga Rd., Mississauga, Ontario, Canada (L5H 2J1)
Filed Jan. 5, 1983, Ser. No. 455,638
Claims priority, application Canada, Nov. 26, 1982, 26-11-82-9
Term of patent 14 years
U.S. Cl. D6—570



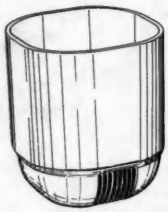
282,328
WALL MOUNTED SHELF UNIT
Anthony J. Brescia, Liverpool, and Shurley Harris, Syracuse, both of N.Y., assignors to Syroco, Inc., Syracuse, N.Y.
Filed Apr. 11, 1983, Ser. No. 483,438
Term of patent 14 years
U.S. Cl. D6—570

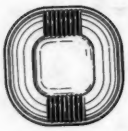
282,329
TUMBLER OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux-Chemin de la Gareune, 62510 Arques, France
Filed Aug. 19, 1983, Ser. No. 524,593
Term of patent 14 years
U.S. Cl. D7—8



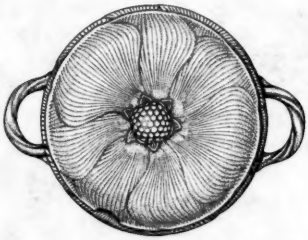
282,330
CUP
James McBride, Seattle, Wash., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Oct. 13, 1983, Ser. No. 541,502
Term of patent 14 years
U.S. Cl. D7—9

282,331
BEVERAGE TUMBLER
Ambrogio Pozzi, Gallarate, Italy, assignor to F.Lli Guzzini S.p.A., Recanati, Italy
Filed Jan. 3, 1983, Ser. No. 455,021
Claims priority, application Italy, Jul. 16, 1982, 22421/82 [U]
Term of patent 14 years
U.S. Cl. D7—14

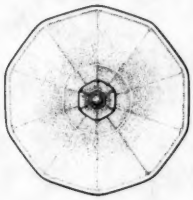


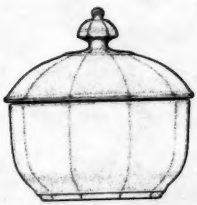


282,332
TUREEN
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jul. 27, 1983, Ser. No. 517,894
Term of patent 14 years
U.S. Cl. D7—17



282,333
SUGAR BOWL
Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Sep. 23, 1983, Ser. No. 535,345
Term of patent 14 years
U.S. Cl. D7—18





282,334
PLATE OR THE LIKE
Ming-Ter Chen, 1232-1236 E. Factory Pl., Los Angeles, Calif. 90013
Filed Jun. 13, 1983, Ser. No. 492,887
Term of patent 14 years
U.S. Cl. D7—36

282,335
FOOD SERVICE TRAY
Malcolm J. Dodd, and Joseph A. Juhas, both of Litchfield, Conn., assignors to PTC Aerospace Inc., Bantam, Conn.
Filed Mar. 17, 1983, Ser. No. 476,179
Term of patent 14 years
U.S. Cl. D7—38

282,336
CONDIMENT HOLDER AND ORGANIZER
Harry F. Collins, Minneapolis, Minn., assignor to Service Ideas, Inc., Minneapolis, Minn.
Filed May 19, 1983, Ser. No. 496,187
Term of patent 14 years
U.S. Cl. D7—58

282,337

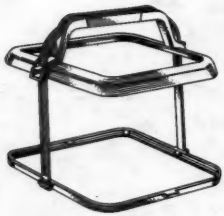
ADJUSTABLE CARRIER FOR CONTAINERS

Augusto A. Picozza, Johnston, R.I., assignor to Dart Industries Inc., Northbrook, Ill.

Filed May 11, 1983, Ser. No. 493,476

Term of patent 14 years

U.S. Cl. D7—70



282,338

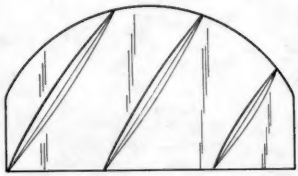
TACO HOLDER

Arthur G. Putt, 5901 Cornell Blvd., North Ridgeville, Ohio 44039

Filed Jun. 1, 1982, Ser. No. 384,036

Term of patent 14 years

U.S. Cl. D7—76



282,339

INSULATED BEVERAGE BOTTLE

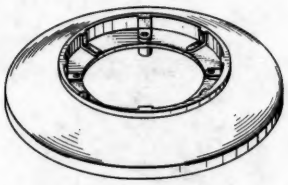
Yung-Kuan Wei, Tainan, Taiwan, assignor to Chung-Yi Wu, Tainan, Taiwan

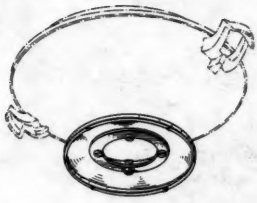
Filed Dec. 2, 1982, Ser. No. 446,210

Term of patent 14 years

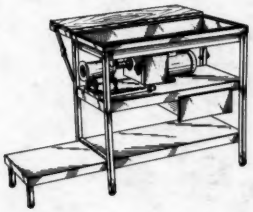
U.S. Cl. D7—77

282,340
BASE FOR A COOKING POT OR THE LIKE
Yanta Lam, Kowloon, Hong Kong, assignor to Meyer Manufacturing Company Ltd., Hong Kong
Filed May 20, 1983, Ser. No. 496,615
Term of patent 14 years
U.S. Cl. D7—387

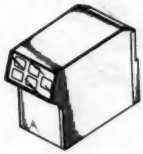




282,341
MEAT GRINDING TABLE
Larry H. Dvorak, Box 57, Manning, N. Dak. 58642
Filed Jul. 11, 1983, Ser. No. 512,883
Term of patent 14 years
U.S. Cl. D7—372

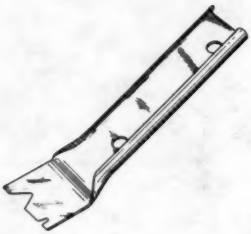


282,342
BEVERAGE DISPENSER VALVE
William J. Saunders, Atlanta; Robert D. Bruffey, Jr., Lilburn, both of Ga.; Edwin Pounder, La Canada; Richard E. Morrison, Temple City, and Carlos Cojulun, Los Angeles, all of Calif., assignors to The Coca-Cola Company, Atlanta, Ga. and Transdynamics, Inc., El Monte, Calif.
Filed Mar. 11, 1983, Ser. No. 474,624
Term of patent 14 years
U.S. Cl. D7—398

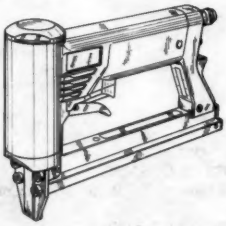


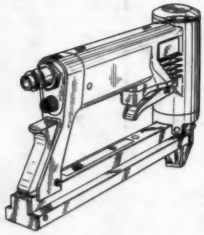
282,343
BOTTLE OPENER
Kenwood E. Pinder, 7634 Garrett Dr., Delta, British Columbia, Canada (V4C 7P5)
Filed Mar. 21, 1983, Ser. No. 477,231
Claims priority, application Canada, Nov. 10, 1982, 10-11-82-3
Term of patent 14 years
U.S. Cl. D8—40

282,344
AUTOMOTIVE TRIM CLIP TOOL
Henry B. Wilcox, 927 N. Macomb St., Apt. 12C, Monroe, Mich. 48161
Filed Feb. 28, 1983, Ser. No. 457,735
Term of patent 14 years
U.S. Cl. D8—16

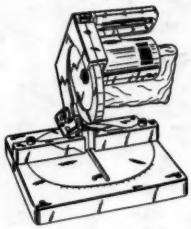


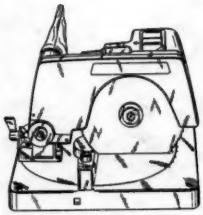
282,345
PNEUMATIC FASTENER DRIVING TOOL
Hellmüth Fehrs, Haldesdorferstr. 22, 2000 Hamburg 71, Fed. Rep. of Germany
Filed Jul. 29, 1983, Ser. No. 518,667
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, DM/002 462
Term of patent 14 years
U.S. Cl. D8—49



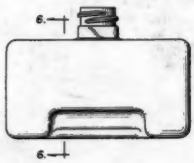


282,346
CHOP SAW
Peter-Paul Pioch, Idstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.
Filed Sep. 22, 1983, Ser. No. 534,727
Claims priority, application Fed. Rep. of Germany, May 6, 1983, URA 530/83; Jun. 25, 1983, URA 721/83
Term of patent 14 years
U.S. Cl. D8—66

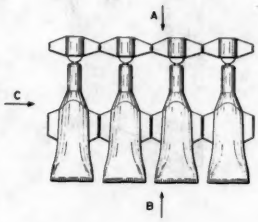




282,347
SOAP CONTAINER
Robert L. Steiner, Chicago, Ill., assignor to Steiner Company, Inc., Salt Lake City, Utah
Filed Sep. 30, 1982, Ser. No. 430,135
The portion of the term of this patent subsequent to May 21, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—403



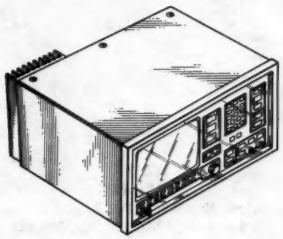
282,348
MULTI-UNIT PACKAGE OF CONTAINERS FOR PHARMACEUTICAL PRODUCTS
Alberto Federighi, Viareggio, Italy, assignor to FARMIGEA S.p.A., Pisa, Italy
Filed Nov. 17, 1982, Ser. No. 442,314
Claims priority, application Italy, May 21, 1982, 53315182[U]
Term of patent 14 years
U.S. Cl. D9—341



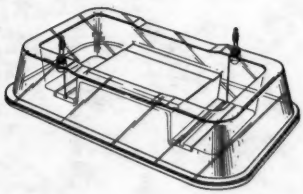
282,349
PLASTIC BOTTLE
Craig A. Larson, Westfield Court, and Richard C. Darr, Seville, both of Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.
Filed May 9, 1983, Ser. No. 492,728
Term of patent 14 years
U.S. Cl. D9—395

282,350
PORTABLE RECEIVER UNIT FOR A METALLIC OBJECT DETECTOR
Richard C. Thomas, Cramlington, and David J. Daniels, Ponteland, both of England, assignors to British Gas Corporation, London, England
Filed Jul. 19, 1983, Ser. No. 515,070
Claims priority, application United Kingdom, Jan. 21, 1983, 1010939
Term of patent 14 years
U.S. Cl. D10—47

282,351
DIGITAL OSCILLOSCOPE
Russell H. Nord, Fort Atkinson; Garry A. Williams, Lake Mills, and Frederick A. Rose, Fort Atkinson, all of Wis., assignors to Norland Corporation, Fort Atkinson, Wis.
Filed Oct. 11, 1983, Ser. No. 540,784
Term of patent 14 years
U.S. Cl. D10—76

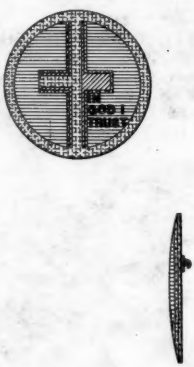


282,352
HORIZONTAL GEL SLAB ELECTROPHORESIS UNIT
Peter S. Hoefer, and Eric Coates, both of San Francisco, Calif., assignors to Hoefer Scientific Instruments, San Francisco, Calif.
Filed Jul. 8, 1983, Ser. No. 511,914
Term of patent 14 years
U.S. Cl. D10—81



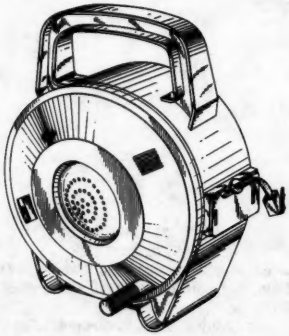
282,353
PENDANT
Christine C. L. Wong, 110 Soy Street, 11th Floor, Flat D, Mongkok, Kowloon, Hong Kong
Filed Oct. 3, 1983, Ser. No. 538,167
Term of patent 14 years
U.S. Cl. D11—82

282,354
LAPEL PIN
Frederic P. Merrels, Box 907 LOW, Locust Grove, Va. 22580
Filed Jun. 29, 1983, Ser. No. 508,928
Term of patent 14 years
U.S. Cl. D11—96

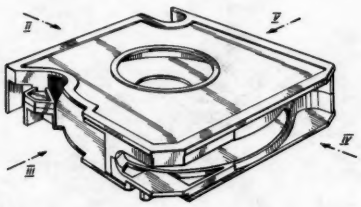


282,355
WOOD PLAQUE
James R. Hartzell, 2570 Troy-Sidney Rd., Troy, Ohio 45373
Filed Dec. 23, 1983, Ser. No. 564,933
Term of patent 14 years
U.S. Cl. D11—132

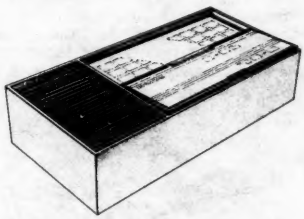
282,356
TELEPHONE ANSWERING UNIT OR SIMILAR ARTICLE
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electronic Products, Inc., Providence, R.I.
Filed Oct. 25, 1983, Ser. No. 543,814
Term of patent 14 years
U.S. Cl. D14—4



282,357
MICROFILM CARTRIDGE OR SIMILAR ARTICLE
Peter L. Gell, Redfern, Australia, assignor to Plastex Technology (Curacao) N.V., Curacao, Netherlands Antilles
Filed Sep. 30, 1983, Ser. No. 537,577
Term of patent 14 years
U.S. Cl. D14—11



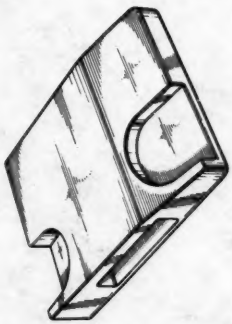
282,358
TELECOMMUNICATIONS SYSTEM CONSOLE OR SIMILAR ARTICLE
John S. Campbell; John G. Engstrom, both of Indianapolis, Ind., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Information Systems Inc., Holmdel, N.J.
Filed Apr. 21, 1983, Ser. No. 487,016
Term of patent 14 years
U.S. Cl. D14—52



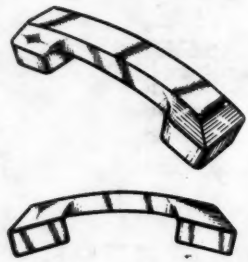
282,359
TELEPHONE OR SIMILAR ARTICLE
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Oct. 25, 1983, Ser. No. 543,813
Term of patent 14 years
U.S. Cl. D14—53

282,360
INTERCOMMUNICATION UNIT
Hiroshi Yamagata, and Kendo Makihara, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 25, 1983, Ser. No. 497,876
Claims priority, application Japan, Nov. 30, 1982, 57-54179
Term of patent 14 years
U.S. Cl. D14—59

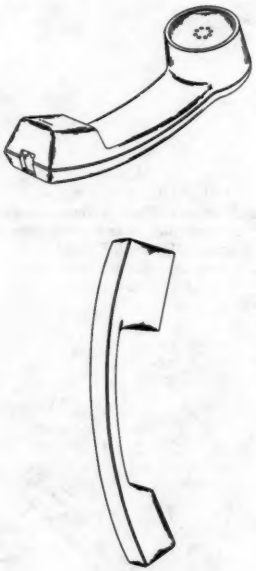
282,361
TELEPHONE SET BASE
Michael Brown, Nepean; Clifford D. Read, Almonte, and Warren K. Ellis, Constance Bay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Feb. 15, 1983, Ser. No. 466,421
Term of patent 14 years
U.S. Cl. D14—60



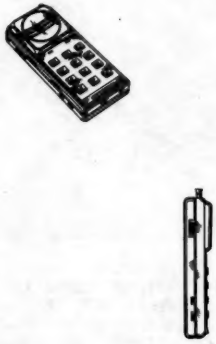
282,362
HOUSING FOR A TELEPHONE HANDSET
Michael Brown, Nepean; Clifford D. Read, Almonte, and Warren K. Ellis, Constance Bay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Feb. 15, 1983, Ser. No. 466,419
Term of patent 14 years
U.S. Cl. D14—63



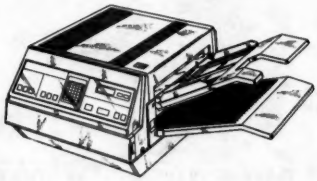
282,363
TELEPHONE HANDSET
Henry Kapper, Raleigh, N.C.; Walter F. Kraus, LaGrangeville, N.Y., and Joel M. Wittkamp, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 12, 1983, Ser. No. 522,450
Term of patent 14 years
U.S. Cl. D14—63



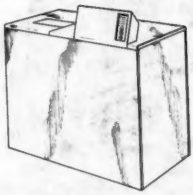
282,364
WIRELESS TELEPHONE HANDSET
Hiroshi Takahashi; Shu Arai; Yasuhiro Kishimoto, and Kiyoshi Tomimatsu, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jun. 8, 1983, Ser. No. 502,075
Term of patent 14 years
U.S. Cl. D14—64



282,365
FACSIMILE TRANSCEIVER
Nobuhiro Hayashida, Kanagawa, Japan, assignor to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan
Filed Nov. 17, 1983, Ser. No. 552,875
Claims priority, application Japan, May 18, 1983, 58-20915
Term of patent 14 years
U.S. Cl. D14—94

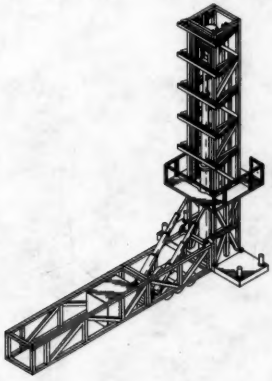


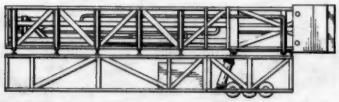
282,366
DATA PROCESSOR
Wayne L. Aderman, Zumbro Falls, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 12, 1983, Ser. No. 493,846
Term of patent 14 years
U.S. Cl. D14—102



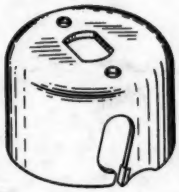
282,367
GRAIN SORTER
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1983, Ser. No. 533,974
Claims priority, application Japan, Jun. 30, 1983, 58-28576
Term of patent 14 years
U.S. Cl. D15—10

282,368
COMBINED ERECTABLE HYDRAULIC DRILLING RIG AND TRANSPORT TRAILER
Albert W. Smith, #1 Chamberlain Center; P.O. Box 8735, Tyler, Tex. 74711
Filed Jun. 6, 1983, Ser. No. 501,135
Term of patent 14 years
U.S. Cl. D15—21

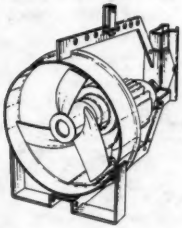




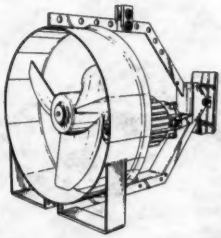
282,369
HOLE SAW
Simon de Villiers, Tigard, Oreg., assignor to Omark Industries, Portland, Oreg.
Filed Feb. 7, 1983, Ser. No. 464,470
Term of patent 14 years
U.S. Cl. D15—139



282,370
COMBINED SUBMERSIBLE SUSPENSION MIXER AND RACK
Lars Ogren, Vasby, Sweden, assignor to ITT Industries, Inc., New York, N.Y.
Filed Jul. 7, 1983, Ser. No. 511,699
Claims priority, application Sweden, Jan. 28, 1983, 83000241
Term of patent 14 years
U.S. Cl. D15—147

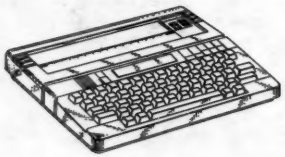


282,371
COMBINED SUBMERSIBLE SUSPENSION MIXER AND RACK
Gunnar Johansson, Marsta, Sweden, assignor to ITT Industries, Inc., New York, N.Y.
Filed Jul. 7, 1983, Ser. No. 511,698
Claims priority, application Sweden, Jan. 28, 1983, 83000240
Term of patent 14 years
U.S. Cl. D15—147

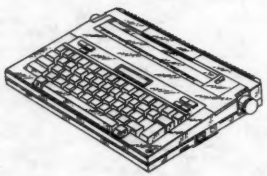


282,372
SUNGLASSES
Josef Blaimschein, Piberbach, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Dec. 23, 1983, Ser. No. 565,034
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 11AR2759/83
Term of patent 14 years
U.S. Cl. D16—102

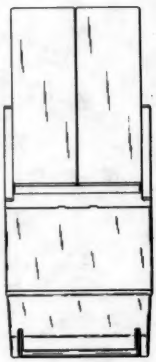
282,373
ELECTRONIC TYPEWRITER
Masaki Takahashi, Yamato, and Osamu Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 19, 1984, Ser. No. 571,825
Claims priority, application Japan, Jul. 25, 1983, 58-32621
Term of patent 14 years
U.S. Cl. D18—1

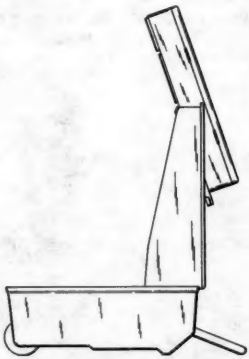


282,374
ELECTRONIC TYPEWRITER
Tomohiro Maekawa, Yokohama, and Richard Nibley, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 28, 1983, Ser. No. 555,524
Claims priority, application Japan, Jun. 1, 1983, 58-23456
Term of patent 14 years
U.S. Cl. D18—1



282,375
PORTABLE VOTING BOOTH
Richard G. Dolson, Canton, Conn., assignor to Veeder Industries Inc., Hartford, Conn.
Filed Oct. 19, 1983, Ser. No. 543,395
Term of patent 14 years
U.S. Cl. D18—6





282,376

DESK-TOP ELECTRONIC CALCULATOR

Nobuo Kikuchi, Tokyo, and Kazuyoshi Odagawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

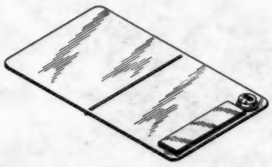
Filed Sep. 22, 1983, Ser. No. 534,670
Claims priority, application Japan, Apr. 6, 1983, 58-14731
Term of patent 14 years
U.S. Cl. D18—7

282,377

FOLDER WITH CLOCK AND MEMO PAD OR THE LIKE

William W. Curran, Manhasset, N.Y., assignor to Balance House, Ltd., New York, N.N.Y.

Filed May 9, 1983, Ser. No. 492,615
Term of patent 14 years
U.S. Cl. D19—26



282,378

MARKING PEN

Toshiharu Ohyabu, and Masayuki Hasegawa, both of Nagoya, Japan, assignors to Shachihata Industry Co., Ltd., Nagoya, Japan

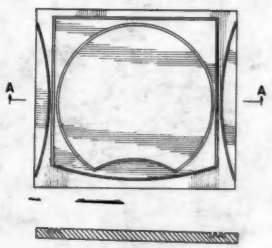
Filed Oct. 5, 1983, Ser. No. 539,289
Claims priority, application Japan, Apr. 16, 1983, 58-016212
Term of patent 14 years
U.S. Cl. D19—43

282,379

DRAWING BOARD

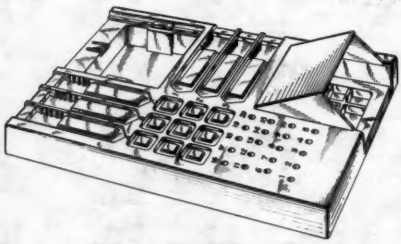
Joseph Smith, 177A Hobson St., Auckland, and Colin W. Rogers, 42 Estuary Rd., Weymouth, Auckland, both of New Zealand

Filed Jun. 17, 1983, Ser. No. 506,020
Claims priority, application New Zealand, Dec. 17, 1982, 18162
Term of patent 14 years
U.S. Cl. D19—52

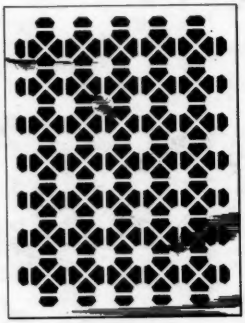


282,380
HOLDER FOR RETAINING SMALL METAL OBJECTS MAGNETICALLY
Feather W. King, Ashland, Oreg., assignor to Blue Feather Products, Inc., Ashland, Oreg.
Continuation-in-part of Ser. No. 133,434, Mar. 24, 1980, Pat. No. Des. 266,934. This application Nov. 16, 1982, Ser. No. 442,156
The portion of the term of this patent subsequent to Nov. 16, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75

282,381
GAME FOR A MATCHING GAME
Jane C. Dyar, New York, N.Y., assignor to CBS Inc., New York, N.Y.
Filed Apr. 4, 1983, Ser. No. 481,686
Term of patent 14 years
U.S. Cl. D21—20



282,382
GAME BOARD
Robert L. Bender, and Annie L. Bender, both of 513 W. Ferry St., Berrien Springs, Mich. 49103
Filed Jul. 26, 1983, Ser. No. 517,391
Term of patent 14 years
U.S. Cl. D21—34

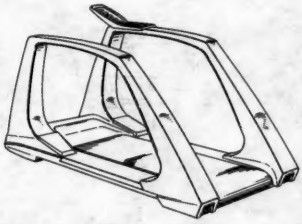


282,383
MUSICAL TOY
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Nov. 16, 1983, Ser. No. 552,598
Claims priority, application Japan, Jun. 10, 1983, 58-25034
Term of patent 14 years
U.S. Cl. D21—63

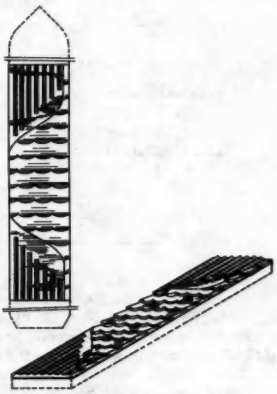
282,384
RIDING TOY
Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Filed Oct. 21, 1983, Ser. No. 544,378
Claims priority, application Japan, Apr. 28, 1983, 58-18130
Term of patent 14 years
U.S. Cl. D21—78

282,385
TOY ZOO
Augusto Argandona, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,583
Term of patent 14 years
U.S. Cl. D21—115

282,386
TREADMILL
Michael J. Dealey, and Ian G. G. Fowell, both of Birmingham, England, assignors to Sport Engineering Limited, Birmingham, England
Filed Dec. 28, 1983, Ser. No. 566,315
Claims priority, application United Kingdom, Oct. 21, 1985, 1015800
Term of patent 14 years
U.S. Cl. D21—192

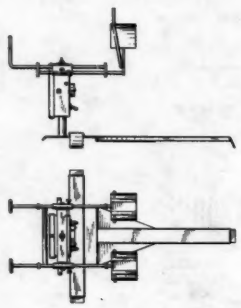


282,387
APPLIQUE FOR CROSS COUNTRY SKIS
Oswald Pichler, Hohenbrunn-Riemerling, Fed. Rep. of Germany, assignor to Trak Sportartikel GmbH, Taufkirchen, Fed. Rep. of Germany
Filed Aug. 3, 1982, Ser. No. 404,969
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, MR 12 855
Term of patent 14 years
U.S. Cl. D21—230

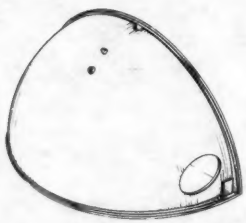


282,388
RIFLE BOLT
Neal K. Pashman, Wichita Falls, Tex., assignor to Wichcraft Prodco, Inc., Wichita Falls, Tex.
Filed Aug. 1, 1983, Ser. No. 519,409
Term of patent 14 years
U.S. Cl. D22—7

282,389
SIGNALLING DEVICE FOR FISHING
Clarence E. Hill, Tipton, Mo., assignor to Sportsman's Enterprises, St. Joseph, Mo.
Filed Sep. 6, 1983, Ser. No. 529,377
Term of patent 14 years
U.S. Cl. D22—13

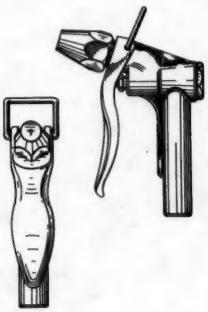


282,390
RODENT CONTROL DEVICE
Harold A. Ford, Claremont, and Cecil G. Young, La Canada, both of Calif., assignors to Ace Termite & Pest Control, Culver City, Calif.
Filed Jun. 21, 1983, Ser. No. 506,458
Term of patent 14 years
U.S. Cl. D22—18



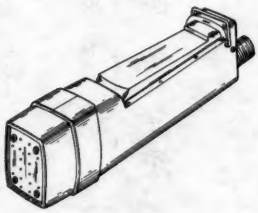
282,391
FISHING LURE
Gene A. Trisch, 3310 Remington Rd., Caro, Mich. 48723
Filed Aug. 11, 1983, Ser. No. 521,982
Term of patent 14 years
U.S. Cl. D22—29

282,392
SPRAY GUN
Robert W. Hengesbach, 7886 Mentor Rd., Mentor, Ohio 44060
Filed Jan. 28, 1983, Ser. No. 461,874
Term of patent 14 years
U.S. Cl. D23—17

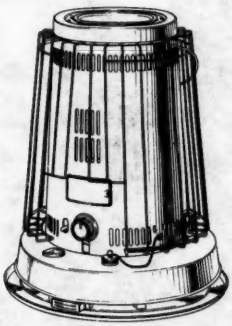


282,393
COMBINED PRESSURE RELIEF VALVE AND CLAMP
Wendell D. Johnson, Fairport, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.
Filed Apr. 1, 1983, Ser. No. 481,258
Term of patent 14 years
U.S. Cl. D23—20

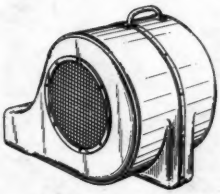
282,394
SPRAY HEAD
Ralph Ettlinger, Glencoe, Ill., assignor to Amco Corporation, Chicago, Ill.
Filed Sep. 19, 1983, Ser. No. 533,292
Term of patent 14 years
U.S. Cl. D23—37



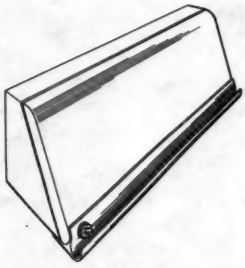
282,395
STOVE
Hideo Nishikawa; Kenzo Okamoto; Koichi Saksi, all of Osaka, and Fumihiko Kitada, Neyagawa, all of Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.), Osaka, Japan
Filed Jun. 21, 1983, Ser. No. 506,310
Claims priority, application Japan, Apr. 22, 1983, 58-17357
Term of patent 14 years
U.S. Cl. D23—121



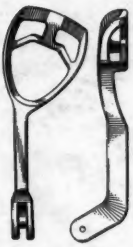
282,396
CARPET DRYER
Lloyd J. Weaver, Rapid City, S. Dak., assignor to Lloyd's Carpet & Furniture Cleaning, Inc., Rapid City, S. Dak.
Filed Dec. 6, 1982, Ser. No. 447,293
Term of patent 14 years
U.S. Cl. D23—162



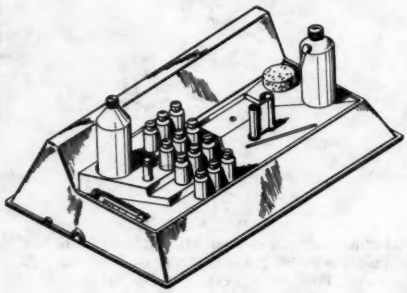
282,397
X-RAY VIEWER
Ed Martin, Charlotte, and Dan Truette, Pineville, both of N.C., assignors to Pelton & Crane Company, Charlotte, N.C.
Filed Jul. 18, 1983, Ser. No. 514,732
Term of patent 14 years
U.S. Cl. D24—2



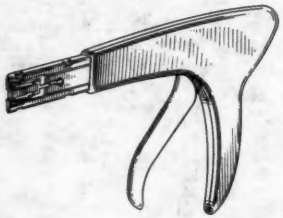
282,398
STIRRUP FOR MEDICAL EXAMINATION TABLE
Leonard J. Yindra, Manitowoc, Wis., assignor to Hamilton Industries, Two Rivers, Wis.
Filed Sep. 29, 1983, Ser. No. 537,342
Term of patent 14 years
U.S. Cl. D24—7



282,399
WATER ANALYSIS LABORATORY
David A. Stafford, Dayton, Ohio, assignor to Miami Products & Chemicals Co., Dayton, Ohio
Filed Apr. 18, 1983, Ser. No. 485,995
Term of patent 14 years
U.S. Cl. D24—17



282,400
SURGICAL SKIN STAPLER
Thomas D. Guy, Trumbull; Paul O. Rawson, Easton, and Richard H. Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed May 5, 1982, Ser. No. 375,002
Term of patent 14 years
U.S. Cl. D24—26



282,401
DISPOSABLE CARTRIDGE FOR A LINEAR SURGICAL STAPLER
Herbert W. Korthoff, Wilton, and Thomas Tompkins, Trumbull, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Mar. 30, 1983, Ser. No. 480,444
Term of patent 14 years
U.S. Cl. D24—26

282,402
SURGICAL KNIFE BLADE
Friedrich W. Schmidt, Ephrata, and Lester W. Moll, Wyomissing Hills, both of Pa., assignors to Sharpoint, Inc., Reading, Pa.
Filed Dec. 22, 1982, Ser. No. 452,093
Term of patent 14 years
U.S. Cl. D24—29

282,403
SUCTION COAGULATOR
John T. Shackelford, Longmount, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.
Filed Aug. 4, 1983, Ser. No. 520,402
Term of patent 14 years
U.S. Cl. D24—54

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JANUARY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Moore, Carl O., 4,567,055, Cl. 426-578.000.

A-Lok Products, Inc.: *See*—
Ditcher, Jack, 4,566,483, Cl. 137-372.000.

A. Natterman & Cie GmbH: *See*—
Posanski, Ulrich; Ghyczy, Miklos; Bauer, Kurt-Heinz; and Wendel, Armin, 4,567,161, Cl. 514-23.000.

A. Nattermann & Cie GmbH: *See*—
Durr, Manfred; Gajdos, Benedikt; Gneuss, Klaus-Dieter; Harhausen, Ekkehard; and Seidel, Jurgen, 4,567,202, Cl. 514-656.000.

A. Zeitlin & Associates: *See*—
Zandel, Adam; and Zeitlin, Alexander, 4,566,372, Cl. 92-168.000.

AB Asea-Atom: *See*—
Suvanto, Antti, 4,566,302, Cl. 72-146.000.

AB Volvo: *See*—
Kronogard, Sven O., deceased; Kronogard, Clas O.; and Kronogard, Hakan, 4,566,279, Cl. 60-718.000.

Abele, Anton: *See*—
Bihler, Franz; and Abele, Anton, 4,566,706, Cl. 280-5.220.

ABIC Ltd.: *See*—
Simonovitch, Chaim; Hoffman, Theodor; and Sasson, Sabar, 4,566,995, Cl. 260-239.30B.

Abo, Keiju: *See*—
Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,566,354, Cl. 74-866.000.

Abraham, Nicholas F., to World Video Library, Inc. Recorded program communication system. 4,567,512, Cl. 358-86.000.

Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., to United States of America, Army. Multi-product acousto-optic time integrating correlator. 4,566,760, Cl. 350-358.000.

Acar, Mustafa, to Pittway Corporation. Monitoring system. 4,567,471, Cl. 340-513.000.

Achilles Corporation: *See*—
Sogabe, Yoji; Uchida, Katsumi; and Harada, Kunihiko, 4,567,093, Cl. 428-250.000.

Ackerman, Robert T.: *See*—
Jorgensen, Ray B.; and Ackerman, Robert T., 4,566,371, Cl. 92-92.000.

Ackermann, Bernd: *See*—
Reimann, Kurt; Ackermann, Bernd; Loeb, Ruediger; and Ruther, Claus, 4,567,411, Cl. 318-341.000.

Acree, William M.; Edwards, Bobby; and Black, John W., to American Home Products Corporation. Inactivated canine coronavirus vaccine. 4,567,042, Cl. 424-89.000.

Acree, William M.; Edwards, Bobby; and Black, John W., to American Home Products Corporation (Del.). Canine corona virus vaccine. 4,567,043, Cl. 424-89.000.

Adams, Richard F.: *See*—
Hackleman, David E.; Adams, Richard F.; and Richling, Wayne P., 4,566,193, Cl. 33-1.00D.

Adams, Ronald D.: *See*—
Chia, E. Henry; and Adams, Ronald D., 4,566,524, Cl. 164-461.000.

Adams, Theodore C., Jr.; and Adolph, Horst G., to United States of America, Navy. 1-Fluoro-1,1,5-trinitro-3-oxa-5-azahexane and method of preparation. 4,567,296, Cl. 564-111.000.

Adamson, Martyn G.: *See*—
Vaidyanathan, Swaminathan; and Adamson, Martyn G., 4,567,017, Cl. 376-417.000.

ADIR, s.a.r.l.: *See*—
Lavielle, Gilbert; and Cudennec, Claude, 4,567,169, Cl. 514-089.000.
Malen, Charles; Peglion, Jean-Louis; Laubie, Michel; and Poignant, Jean-Claude, 4,567,181, Cl. 514-256.000.
Wierzbicki, Michel, 4,567,196, Cl. 514-422.000.

Adolph, Horst G.: *See*—
Adams, Theodore C., Jr.; and Adolph, Horst G., 4,567,296, Cl. 564-111.000.

Adolphi, Heinrich: *See*—
Baumann, Annegrit; Kiehs, Karl; and Adolphi, Heinrich, 4,567,170, Cl. 514-128.000.

Afzali-Ardakani, Ali; Cohen, Mitchell S.; Pennington, Keith S.; and Sachdev, Krishna G., to International Business Machines Corporation. Electroerosion recording medium of improved lubricity. 4,567,490, Cl. 346-135.100.

AGB Research PLC: *See*—
Smith, Peter E.; and Laxton, Raymond, 4,567,511, Cl. 358-84.000.

Agence Nationale pour la Valorisation et la Recherche (A.N.V.A.R.): *See*—
Foch, Henri; and Roux, Jacques, 4,567,553, Cl. 363-98.000.

Agency of Industrial Science & Technology: *See*—
Hayashi, Yutaka; Hamaguchi, Iwao; and Kobayashi, Kiyohiko, 4,567,061, Cl. 427-93.000.

Agfa-Gevaert AG: *See*—
Muller, Jurgen; and Ihm, Werner, 4,566,682, Cl. 271-90.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Fursich, Manfred; Treiber, Helmut; Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,566,786, Cl. 355-77.000.
Nitsch, Wilhelm, 4,566,784, Cl. 355-72.000.

Ahagon, Asahiro: *See*—
Misawa, Makoto; Mizoguchi, Tetsuya; Kawakami, Kinya; and Ahagon, Asahiro, 4,567,225, Cl. 524-526.000.

Ahl, Tommy E.: *See*—
Norberg, Gustav S. I.; Segerstrom, Kjell E. L.; and Ahl, Tommy E., 4,566,951, Cl. 204-12.000.

Ahlers, Klaas: *See*—
Ott, Gunther; Dobbelstein, Arnold; Geist, Michael; Schon, Georg; and Ahlers, Klaas, 4,566,963, Cl. 204-181.700.

Ahlgren, Sture: *See*—
Skafvenstedt, Bengt; and Ahlgren, Sture, 4,567,492, Cl. 346-136.000.

Aiba, Masahiko, to Sharp Kabushiki Kaisha. High-accuracy temperature control. 4,567,353, Cl. 219-501.000.

Aikawa, Eiichi: *See*—
Nishitsuji, Kazuichi; Aikawa, Eiichi; and Haraguchi, Yukio, 4,566,865, Cl. 417-363.000.

Aiken, Hugh H.: *See*—
Danish, Sherif; and Aiken, Hugh H., 4,567,469, Cl. 340-365.00S.

Aikoh Co., Ltd.: *See*—
Kawamura, Jun; and Fukano, Sakuzo, 4,566,518, Cl. 164-53.000.

Ainslie, Benjamin J.: *See*—
Beales, Keith J.; Day, Clive R.; Ainslie, Benjamin J.; and Rush, James D., 4,566,754, Cl. 350-96.300.

Air Products and Chemicals, Inc.: *See*—
Werley, Barry L., 4,566,284, Cl. 62-52.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Komorizono, Junichi; and Miwa, Akihiko, 4,566,276, Cl. 60-585.000.
Masumoto, Tsuyoshi; Inoue, Akihisa; Takahashi, Yoshimi; Hoshi, Akira; and Mizutani, Uichiro, 4,566,323, Cl. 73-295.000.

Aiston, Brian E.: *See*—
Ashworth, Roger A.; Aiston, Brian E.; and Temple, John D., 4,566,161, Cl. 24-642.000.

Aiuola, Franco; and Nipoti, Paolo, to Azionaria Costruzioni Macchine Automatiche - A.C.M.A. - S.p.A. Valve especially suitable for use in filling machines. 4,566,491, Cl. 137-625.660.

Ajay Enterprises Corporation: *See*—
Ogden, Ralph, 4,566,689, Cl. 272-69.000.

Akabane, Yukihiro: *See*—
Takei, Kenji; and Akabane, Yukihiro, 4,566,812, Cl. 384-484.000.

Akaboshi, Sanya: *See*—
Kamano, Yoshiaki; Sugai, Saburo; Okazaki, Tokuji; Yoshida, Seiichiro; and Akaboshi, Sanya, 4,567,172, Cl. 514-179.000.

Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for mechanically breaking up rock. 4,566,736, Cl. 299-23.000.

Akao, Hideyuki: *See*—
Morihisa, Mitsuo; and Akao, Hideyuki, 4,567,575, Cl. 364-900.000.

Akashi, Tamotsu; and Araki, Masatada, to Nippon Oil and Fats Co., Ltd. High density boron nitride-containing sintered body for cutting tool and a method of producing the same. 4,566,905, Cl. 75-244.000.

Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, to Toyota Jidosha Kabushiki Kaisha. Transmission with driven shaft and two clutching devices at the same ends of two parallel driving shafts. 4,566,348, Cl. 74-359.000.

Akatsuka, Koichi: *See*—
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.

Akiba, Takashi, to Nikkiso Co., Ltd. Pulsation-free volumetric pump. 4,566,858, Cl. 417-22.000.

Akimoto, Akira: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.

Akisada, Masahide; Ookawa, Norio; and Takamura, Yuji, to Fuji Photo Film Co., Ltd. Multiple image type photographing apparatus. 4,566,767, Cl. 354-76.000.

Akiyama, Yasuhiro: *See—*
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.

Akrabawi, Mohammad. Lawn mower disposable grass collection bag attachment. 4,566,257, Cl. 56-202.000.

Aktiebolaget IRO: *See—*
Flink, Claes H., 4,566,849, Cl. 415-92.000.

Aktiengesellschaft Adolph Saurer: *See—*
Rodgers, Franklin, 4,566,500, Cl. 139-446.000.

Al-Ameeri, Rasheed S.: *See—*
Owaysi, Fathi A.; and Al-Ameeri, Rasheed S., 4,567,315, Cl. 585-827.000.

Al Mouhamed, Mayez; Csakvary, Etienne; De Cosnac, Bertrand; and Noel, Jean-Paul, to Commissariat a l'Energie Atomique. Measured-force gripper device of articulated structure having several degrees of freedom. 4,566,845, Cl. 414-735.000.

Alcock, Philip: *See—*
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Alcock, Philip, 4,566,503, Cl. 140-140.000.

Aldag, Arthur W., Jr., to Phillips Petroleum Company. Catalytic reforming. 4,566,967, Cl. 208-135.000.

Alden, Peter: *See—*
Egan, Paul F.; Broadfoot, William D.; and Alden, Peter, 4,566,820, Cl. 404-14.000.

Aldridge, Clyde L.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,567,156, Cl. 502-173.000.

Alfred Karcher GmbH & Co.: *See—*
Schulze, Werner; Gerich, Josef; Scheef, Emil; and Dautel, Heinz, 4,566,723, Cl. 285-86.000.

Alie, Enrique; Gilmore, Arthur H.; and Mack, Henry J., Jr., to Falcon Jet Corporation. Air and light utility assemblies. 4,567,547, Cl. 362-154.000.

All States Plastic Mfg. Co., Inc.: *See—*
Zeller, John C.; and Wells, Peter M., Jr., 4,567,546, Cl. 361-420.000.

Allen, David: *See—*
Baer, Ralph H.; and Allen, David, 4,567,532, Cl. 358-342.000.

Allen, George A.: *See—*
Crankshaw, Michael; and Allen, George A., 4,566,933, Cl. 156-444.000.

Allen, Terry L.: *See—*
Sachleben, Leroy R.; Korte, Kevin R.; Snyder, Daniel D.; and Allen, Terry L., 4,566,468, Cl. 131-297.000.

Allford, Daniel W.: *See—*
Sullivan, Eric C.; and Allford, Daniel W., 4,567,343, Cl. 219-74.000.

Allgulin, Torkel, to Boliden Aktiebolag. Method for purifying aqueous solutions. 4,566,975, Cl. 210-711.000.

Allied Corporation: *See—*
Bolenbaugh, Daniel L.; and Herzog, Robert E., 4,566,564, Cl. 188-73.330.
Hemmer, Valentine J., 4,566,752, Cl. 339-262.00R.
Li, Hsin L.; Morris, Thomas K.; Seal, David B.; and Limoncelli, Edward V., 4,566,525, Cl. 164-463.000.
O'Handley, Robert C., 4,566,917, Cl. 148-31.550.
Sibilia, John P.; Kim, Hyo-gun; and Paterson, Arthur R., 4,566,991, Cl. 252-512.000.

Allis-Chalmers Corporation: *See—*
Donelson, Richard K., 4,566,166, Cl. 29-156.80R.

Almet Hardware Limited: *See—*
Klein, David, 4,566,725, Cl. 292-191.000.

Alofs Manufacturing Company: *See—*
Van der Loon, Dwain; and Curths, Gary, 4,566,349, Cl. 74-475.000.

Aloi, Anthony J.; Brooks, George D.; and Prince, Ronald E., to General Electric Company. Ammunition reorienting process. 4,566,580, Cl. 193-48.000.

Alt, Gerhard H.; and Bannon, James S., to Monsanto Company. Herbicidal 2-haloacetanilides. 4,567,299, Cl. 564-214.000.

Altwicker, Gerd; and Eiringhaus, Wilhelm, to William Prym-Werke KG. Actuating assembly for the prime movers of riveting presses and the like. 4,566,182, Cl. 29-715.000.

Aluma Systems, Incorporated: *See—*
Johnston, Ronald J., 4,566,819, Cl. 403-385.000.

Ambrosi, Dominique; and de Reinach Hirtzbach, Francois, to Rhone-Poulenc Agrochimie. Selective herbicidal benzylcarbamoylpyridine derivatives. 4,566,899, Cl. 71-93.000.

Amemiya, Yasuhiro: *See—*
Yoshida, Zenichi; Kato, Susumu; Amemiya, Yasuhiro; and Yanai, Keisuke, 4,567,308, Cl. 585-375.000.

Amerex Corporation: *See—*
Powell, Robert F., 4,566,308, Cl. 73-4.00R.

American Home Products Corporation: *See—*
Acree, William M.; Edwards, Bobby; and Black, John W., 4,567,042, Cl. 424-89.000.
Wei, Peter H. L.; and Gregory, Francis J., 4,567,267, Cl. 546-114.000.

American Home Products Corporation (Del.): *See—*
Acree, William M.; Edwards, Bobby; and Black, John W., 4,567,043, Cl. 424-89.000.

American Hospital Supply Corporation: *See—*
Farr, James I., deceased, 4,566,452, Cl. 128-200.210.

American Roller Company: *See—*
Brands, George, 4,566,162, Cl. 26-105.000.

Ames, William A., to Eastman Kodak Company. Polyolefin containing hot-melt adhesives having short set time and both good low and high temperature bond strength properties. 4,567,223, Cl. 524-489.000.

Amhil Enterprises Ltd.: *See—*
Rogers, J. David, 4,566,605, Cl. 220-90.200.

Amjad, Zahid: *See—*
Masler, William F., III; and Amjad, Zahid, 4,566,973, Cl. 210-701.000.
Masler, William F., III; and Amjad, Zahid, 4,566,974, Cl. 210-701.000.

Amlani, Kish; and Gindy, Sherif, to Eaton Corporation. Mechanical switching means for providing shunt calibration in a rotary transformer system. 4,567,377, Cl. 307-112.000.

Ammermann, Eberhard: *See—*
Eicken, Karl; Scheib, Klaus; Theobald, Hans; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,567,263, Cl. 544-263.000.

AMP Incorporated: *See—*
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.

Amundsen, Robert F. Solar collector. 4,566,433, Cl. 126-439.000.

Analgesic Associates: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,567,183, Cl. 514-264.000.

Andersen Corporation: *See—*
Groth, John P., 4,566,831, Cl. 410-117.000.

Anderson Company of Indiana, The: *See—*
Baerenwald, Philip M.; Mohnach, Michael G.; and Plisky, John J., 4,566,147, Cl. 15-250.420.
Harbison, William H., 4,566,146, Cl. 15-250.340.

Anderson, David G., to Miner Enterprises. Polymeric apparatus and method of making the same. 4,566,678, Cl. 267-141.100.

Ando, Seigo: *See—*
Yamada, Takeo; Yamamoto, Tomohisa; Ando, Seigo; and Kawase, Yoshihiro, 4,567,435, Cl. 324-207.000.

Angquist, Lennart: *See—*
Zetterberg, Gunnar; and Angquist, Lennart, 4,567,554, Cl. 363-138.000.

Annen, Klaus: *See—*
Hofmeister, Helmut; Laurent, Henry; Annen, Klaus; and Wiechert, Rudolf, 4,567,002, Cl. 260-397.400.

Anscher, Joseph; and Smous, Dale, to National Molding Corporation. Cradle clip. 4,566,660, Cl. 248-74.200.

Anscomb, Timothy, to Schering-Prebbles Limited. Multiple opening structure receptacle. 4,566,613, Cl. 222-541.000.

Anton Cramer GmbH & Co. KG: *See—*
Woste, Josef, 4,567,064, Cl. 427-157.000.

Anzenhofer, Wolfgang: *See—*
Knabe, Martin; and Anzenhofer, Wolfgang, 4,566,730, Cl. 296-221.000.

Aoki, Daiichi; Nakamura, Yoshinori; and Orimoto, Hiroyuki. Biaxially oriented container excellent in heat resisting property and pressure resisting property. 4,567,224, Cl. 524-494.000.

Aoki, Hirohiko: *See—*
Hirai, Yoshihisa; Shima, Masanori; and Aoki, Hirohiko, 4,566,825, Cl. 405-267.000.

Appleman, Robert H., to Westinghouse Electric Corp. Sludge removing apparatus for a steam generator. 4,566,406, Cl. 122-405.000.

Applied Biochemists, Inc.: *See—*
Bruno, Leonard C.; and Bruno, Mark M., 4,566,985, Cl. 252-174.120.

Aqua-Chem, Inc.: *See—*
O'Dell, Donald E., 4,566,301, Cl. 72-75.000.

Arai, Tetsuji: *See—*
Mimura, Yoshiki; Arai, Tetsuji; and Fukuda, Satoru, 4,567,352, Cl. 219-405.000.

Arai, Yoneaki, to Casio Computer Co., Ltd. Electronic musical instrument. 4,566,363, Cl. 84-1.080.

Arakawa, Jun; and Watanabe, Toshiyuki, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,567,135, Cl. 430-505.000.

Araki, Masatada: *See—*
Akashi, Tamotsu; and Araki, Masatada, 4,566,905, Cl. 75-244.000.

Aranyi, Ernie: *See—*
Green, David T.; and Aranyi, Ernie, 4,566,620, Cl. 227-19.000.

Araya, Shinji; and Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Demand estimation apparatus. 4,567,566, Cl. 364-554.000.

Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., to Exxon Research and Engineering Co. Ruthenium catalysts, and use thereof for Fischer-Tropsch synthesis. 4,567,205, Cl. 518-715.000.

Argoud, Christian: *See—*
Cognet, Louis; Argoud, Christian; Matray, Francois; and Mallevialle, Joel, 4,567,020, Cl. 422-101.000.

Arhan, Pierre J.; and Hero, Marc R., to Universite Rene Descartes Paris V. Probe with variable geometry for measuring the radial strains in a sphincter of a living organism. 4,566,465, Cl. 128-778.000.

Arimoto, Satomi; Hirakawa, Hiroyuki; and Maekawa, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Alternating current limiting apparatus. 4,567,538, Cl. 361-58.000.

Arioka, Hiroyuki; Nishimatsu, Masaharu; and Watanabe, Akio, to TDK Corporation. Magnetic recording medium. 4,567,083, Cl. 428-141.000.

Armstrong, Gordon P.: *See—*
Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., 4,567,102, Cl. 428-391.000.

Arnaud, Robert, to Mecilec. Infra-red radiation temperature measurement of a moving wire. 4,566,809, Cl. 374-126.000.

Arner, Russell E.; Emrich, Ronald J.; Gianelos, James; and Haynes, Marlon L., to B. F. Goodrich Company, The. Method of sample preparation and apparatus therefor. 4,566,293, Cl. 62-514.00R.

Arneson, Howard M. Apparatus for buffing articles. 4,566,144, Cl. 15-3.000.

Arnoldt, Peter J.; and Greiner, Waldemar H., to Ductmate Industries, Inc. Duct joint frame. 4,566,724, Cl. 285-364.000.

Arons, Richard M.: *See—*
David, Lawrence D.; and Arons, Richard M., 4,567,101, Cl. 428-364.000.

Arthur, Allan A.: *See—*
Goldberg, David A.; Flood, William S.; Arthur, Allan A.; and Voelker, Ferdinand, 4,567,452, Cl. 332-7.000.

Arthur, Gregory L.; and Hunnicutt, Wayne E., to G & J Industries, Inc. Light trailer with independent wheel suspensions. 4,566,717, Cl. 280-701.000.

Arvin Industries, Inc.: *See—*
Otterbein, Roy T., 4,566,290, Cl. 62-304.000.

Asahi Chemical Co., Ltd.: *See—*
Yoshida, Zenichi; Kato, Susumu; Amemiya, Yasuhiro; and Yanai, Keisuke, 4,567,308, Cl. 585-375.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Matsuo, Hirohumi, 4,566,764, Cl. 350-459.000.

Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, to Clarion Co., Ltd. Sezawa surface-acoustic-wave device using ZnO(0001)/Si-O_2/ Si(100)(011). 4,567,392, Cl. 310-313.00A.

Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, to Clarion Co., Ltd. Surface acoustic wave device having AlN and ZnO layers on a Si substrate. 4,567,393, Cl. 310-313.00A.

Asami, Ken: *See—*
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.

Asano, Toru: *See—*
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, 4,567,470, Cl. 340-365.00C.

ASE (UK) Limited: *See—*
Ashworth, Roger A.; Aiston, Brian E.; and Temple, John D., 4,566,161, Cl. 24-642.000.

ASEA Aktiebolag: *See—*
Eriksson, Stig; Granberg, Bengt; and Westberg, Erik, 4,566,741, Cl. 312-194.000.
Zetterberg, Gunnar; and Angquist, Lennart, 4,567,554, Cl. 363-138.000.

Ashworth, Roger A.; Aiston, Brian E.; and Temple, John D., to ASE (UK) Limited. Buckles for vehicle seat belt system. 4,566,161, Cl. 24-642.000.

Assink, Gerardus J., to U.S. Philips Corporation. Apparatus for reading a disk-shaped optical record carrier. 4,567,533, Cl. 358-342.000.

Assmann, Aloisius: *See—*
Rottmayr, Josef, 4,566,669, Cl. 249-160.000.

AT&T Bell Laboratories: *See—*
Brasen, Daniel; DiGiuseppe, Michael A.; Lourenco, Jose A.; and Mahajan, Subhash, 4,566,934, Cl. 156-622.000.
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,567,325, Cl. 179-6.30R.
Dumbri, Austin C.; and Procyk, Frank J., 4,567,581, Cl. 365-230.000.
Embree, David M.; Goldthorp, David C.; Longenecker, Howard H.; and Vogelpohl, David R., 4,567,333, Cl. 179-84.00T.
Hedlund, Kurt A., 4,567,595, Cl. 371-49.000.
Lottes, Rosanna M.; and Swinehart, Grant E., 4,567,323, Cl. 179-18.00B.
Nelson, Ronald J.; and Wilson, Randall B., 4,566,171, Cl. 29-569.00L.

AT&T Technologies: *See—*
Embree, David M.; Goldthorp, David C.; Longenecker, Howard H.; and Vogelpohl, David R., 4,567,333, Cl. 179-84.00T.

AT&T Technologies, Inc.: *See—*
Correnti, Albert D.; and Potechin, James, 4,566,726, Cl. 294-64.300.
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,567,325, Cl. 179-6.30R.
Kim, Tae Y., 4,566,953, Cl. 204-28.000.

AT&T Teletype Corporation: *See—*
Jacksier, Barry H., 4,567,604, Cl. 375-87.000.

Atkey, Richard E., to Dover Corporation. Selector cabling arrangement. 4,566,561, Cl. 187-20.000.

Atkins, Elise T.: *See—*
Corey, Philip D.; and Atkins, Elise T., 4,567,379, Cl. 307-270.000.

Atlantic Richfield Co.: *See—*
Gussis, Gene L., 4,566,537, Cl. 166-261.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,567,307, Cl. 585-330.000.
Mancinelli, Paul A., 4,567,239, Cl. 525-309.000.

Attinger, Karl: *See—*
Maier, Peter; Attinger, Karl; Sigel, Albert; Hansel, Gernot; Kutscher, Erwin; and Walter, Hartmut, 4,566,830, Cl. 409-182.000.

Autodynamics Corporation of America: *See—*
Clarke, Robert A., 4,566,842, Cl. 414-462.000.

Autoloc Corporation: *See—*
Wodeslavsky, Josef, 4,566,556, Cl. 180-287.000.

Automation Gages, Inc.: *See—*
Choate, Albert G., 4,567,551, Cl. 362-398.000.

Automotive Products plc: *See—*
Leigh-Monstevens, Keith V.; and Wrobleski, David L., 4,566,578, Cl. 192-98.000.

Avco Corporation: *See—*
Miller, Jule A.; Lee, Jack W.; and Thyssen, Jeffrey, 4,566,939, Cl. 156-655.000.

Avery, Leslie R., to RCA Corporation. Semiconductor structure for protecting integrated circuit devices. 4,567,500, Cl. 357-38.000.

Ayer, Donald E., to Upjohn Company, The. 11-Difluoromethylene steroids. 4,567,000, Cl. 260-397.300.

Azionaria Costruzioni Macchine Automatiche - A.C.M.A. - S.p.A.: *See—*
Aiuola, Franco; and Nipoti, Paolo, 4,566,491, Cl. 137-625.660.

B. F. Goodrich Company, The: *See—*
Arner, Russell E.; Emrich, Ronald J.; Gianelos, James; and Haynes, Marlon L., 4,566,293, Cl. 62-514.00R.
Masler, William F., III; and Amjad, Zahid, 4,566,973, Cl. 210-701.000.
Masler, William F., III; and Amjad, Zahid, 4,566,974, Cl. 210-701.000.

Baba, Kiyokazu; Shirao, Shojiro; Nishida, Kenji; and Kiyosawa, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Automatic palletizing system. 4,566,834, Cl. 414-27.000.

Babcock & Wilcox Company, The: *See—*
Dolsen, Philip C.; Chandra, Satish; Hammon, Gordon R.; and Uren, William J., 4,567,482, Cl. 340-825.050.

Babler, James H., to Loyola University of Chicago. Cyclopropanoid cyanoesters and method of making same. 4,567,265, Cl. 546-16.000.

Bachet, Bernard; Daguet, Jean; and Dujardin, Louis, to Commissariat a l'Energie Atomique. Process and apparatus for the in-line inspection of the depth of a weld by a pulse beam. 4,567,345, Cl. 219-121.0PT.

Bacskai, Robert, to Chevron Research Company. Mixed metal alkyl catalyst for olefin polymerization. 4,567,154, Cl. 502-114.000.

Badenhop, Charles T.; and Fischer, Joachim, to Seitz Filter Werke Theo & Geo Seitz GmbH & Co. Production of microfiltration membrane filter. 4,567,009, Cl. 264-41.000.

Badewien, Reinhard, to Plantorgan Werk Heinrich G. E. Christensen KG. Vapor inhalation device. 4,566,451, Cl. 128-200.210.

Baer, Ralph H.; and Allen, David, to Sanders Associates, Inc. Selectable view video record/playback system. 4,567,532, Cl. 358-342.000.

Baerenwald, Philip M.; Mohnach, Michael G.; and Plisky, John J., to Anderson Company of Indiana, The. Clip for a wiper blade refill. 4,566,147, Cl. 15-250.420.

Bagley, James T.; and Simon, Maurice L., to Schlumberger Technology Corporation. Firing system for tubing conveyed perforating gun. 4,566,544, Cl. 175-4.560.

Bagolini, Carlo: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and deWitt, Paolo, 4,567,200, Cl. 514-547.000.

Bailly, Francois P.; Bourgoin, Alain; and Israel, Renato, to Societe Anonyme de Telecommunications. Line circuit for network junctor. 4,567,329, Cl. 179-18.0FA.

Baird Corporation: *See—*
Falls, James J., 4,567,370, Cl. 250-461.100.

Baker, John E.; and Fowler, David P., to Frito-Lay, Inc. Method for producing snacks from dough. 4,567,051, Cl. 426-438.000.

Baker, John G.: *See—*
Bennison, John J.; Longworth, Stuart W.; and Baker, John G., 4,566,972, Cl. 210-698.000.

Baker, John R.; Chenoweth, David V.; and McStravick, David M., to Baker Oil Tools, Inc. Concentric walled conduit for a tubular conduit string. 4,566,495, Cl. 138-149.000.

Baker Oil Tools, Inc.: *See—*
Baker, John R.; Chenoweth, David V.; and McStravick, David M., 4,566,495, Cl. 138-149.000.
Peterson, Elmer R., 4,566,538, Cl. 166-278.000.

Balas, Jaroslav C., to Shell Oil Company. Catalyst passivation process. 4,567,251, Cl. 528-487.000.

Baldry, Peter J.; Collins, John H.; Morantz, Daniel J.; Overton, Terence K. W.; and Wright, David W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Phototropic materials. 4,567,122, Cl. 430-4.000.

Baldwin, John J.; Pietruszkiewicz, Adolph; Bolhofer, William A.; and Lumma, William C., Jr., to Merck & Co., Inc. Amino-phenylthiadiazolediоxides as gastric secretion inhibitors. 4,567,191, Cl. 514-362.000.

Baldwin, John J., to Merck & Co., Inc. β-Adrenergic 2-[4-(3-amino-2-hydroxypropoxy)phenyl]imidazoles. 4,567,276, Cl. 548-343.000.

Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Staudinger, Gunther, to Wacker-Chemie GmbH. Preparation of aqueous N-methylol amide solutions. 4,567,297, Cl. 564-208.000.

Ballard, John R.; Timmis, Peter H.; and Buller, Michael J., to Rolls-Royce Limited. Gas turbine engine infra-red radiation suppressor. 4,566,270, Cl. 60-264.000.

Balz, Werner: *See—*
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.

Ban, Keisuke; and Ohashi, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Method of making a connecting rod. 4,566,519, Cl. 164-97.000.

Banks, Robert L.; and Kukes, Simon G., to Phillips Petroleum Company. Olefin metathesis catalyst. 4,567,159, Cl. 502-219.000.

Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives and antihistaminic agents containing the carbostyril derivatives. 4,567,187, Cl. 514-312.000.

Bannon, James S.: *See*—
Alt, Gerhard H.; and Bannon, James S., 4,567,299, Cl. 564-214.000.

Baran, Walter J., Jr.: *See*—
Comeau, Roger J.; and Baran, Walter J., Jr., 4,566,851, Cl. 415-139.000.

Barchus, David D., to Barchus, David Duane. Overhead pivotal mounting assembly for television set. 4,566,663, Cl. 248-324.000.

Barchus, David Duane: *See*—
Barchus, David D., 4,566,663, Cl. 248-324.000.

Barker, Charles A.; and Rau, Jim L., to TRW Inc. Fluid flow control apparatus. 4,566,477, Cl. 137-101.000.

Barnaby, Harold T., to Core Laboratories, Inc. Mercury pump. 4,566,311, Cl. 73-19.000.

Barnett, Larry R.; Lau, Yue-Ying; Chu, Kwo R.; and Granatstein, Victor L., to United States of America, Navy. Wide-band distributed rf coupler. 4,567,401, Cl. 315-5.000.

Barrett, Arthur M., Jr. Ring binder. 4,566,817, Cl. 402-38.000.

Bartels, Willem J., to U.S. Philips Corporation. X-Ray analysis apparatus comprising a four-crystal monochromator. 4,567,605, Cl. 378-85.000.

Barthelemy, Herve : *See*—
Minier, Jean; Barthelemy, Herve ; and Foglia, Vincent, 4,566,824, Cl. 405-202.000.

Bartlett, Robert L.; Haas, Charles J.; and Legler, John G., to Shopsmith, Inc. Workpiece support system for a power tool. 4,566,510, Cl. 144-1.00C.

Bartolles, Rolf, to Rheinmetall GmbH. Leak detector for seal ring of gun breech mechanism. 4,566,368, Cl. 89-26.000.

Barzantny, Joachim: *See*—
Thissen, Klaus; and Barzantny, Joachim, 4,566,859, Cl. 417-50.000.

BASF Aktiengesellschaft: *See*—
Baumann, Annegrit; Kiehs, Karl; and Adolphi, Heinrich, 4,567,170, Cl. 514-128.000.
Bettinger, Guenter; Pfefferkorn, Dietmar; and Pavelka, Bozidar, 4,566,653, Cl. 242-199.000.
Blinne, Gerd; Bender, Herbert; and Neumann, Peter, 4,567,248, Cl. 528-211.000.
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.
Dressel, Manfred; Eberle, Heinrich; Ripperger, Willi; Ruehenbeck, Wolfgang; and Zwick, Werner, 4,567,294, Cl. 562-555.000.
Echte, Adolf; Gausepohl, Hermann; Hambrecht, Juergen; and Gerberding, Karl, 4,567,232, Cl. 525-53.000.
Eicken, Karl; Scheib, Klaus; Theobald, Hans; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,567,263, Cl. 544-263.000.
Ernst, Hansgeorg; Schmidt, Wolfram; and Paust, Joachim, 4,567,261, Cl. 544-251.000.
Grimmer, Johannes; and Horn, Hans C., 4,567,262, Cl. 544-251.000.
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.
Marx, Hans-Norbert; and Pommer, Ernst-Heinrich, 4,567,277, Cl. 548-306.000.
Naarmann, Herbert, 4,566,955, Cl. 204-59.00R.
Naarmann, Herbert; Heckmann, Walter; Kohler, Gernot; and Simak, Petr, 4,567,250, Cl. 528-423.000.
Plath, Peter; Schirmer, Ulrich; Reissenweber, Gernot; Wuerzer, Bruno; and Retzlaff, Guenter, 4,566,900, Cl. 71-100.000.

BASF Farben Fasern AG: *See*—
Ott, Gunther; Dobbelstein, Arnold; Geist, Michael; Schon, Georg; and Ahlers, Klaas, 4,566,963, Cl. 204-181.700.

Bashaw, Lawrence D., to Honeywell Information Systems Inc. Apparatus for verification of a signal transfer in a preselected path in a data processing system. 4,567,593, Cl. 371-25.000.

Basmajian, Vahan V., to Megatech Corporation. Geothermal heat transfer. 4,566,532, Cl. 165-45.000.

Bateman, Charles D.; Grove, Michael M.; Noland, Lyle J.; and Ward, Wallace E., to Sundstrand Data Control, Inc. Position based ground proximity warning system for aircraft. 4,567,483, Cl. 340-970.000.

Battelle Development Corporation: *See*—
Caulfield, Henry J.; and Rhodes, William T., 4,567,569, Cl. 364-845.000.
McGinniss, Vincent, 4,566,962, Cl. 204-180.900.

Batz, Hans-George, to Boehringer Mannheim GmbH. Chromogen for measuring the formation of hydrogen peroxide based on 1-substituted-aminoantipyrin compounds. 4,567,139, Cl. 435-28.000.

Bauer, Charles E.; and Bold, William A., to Tektronix, Inc. Multilayer interconnect circuitry using photoimageable dielectric. 4,566,186, Cl. 29-852.000.

Bauer, Kurt-Heinz: *See*—
Posanski, Ulrich; Ghyczy, Miklos; Bauer, Kurt-Heinz; and Wendel, Armin, 4,567,161, Cl. 514-23.000.

Bauer, Otto; Eberl, Lernhard; Geyer, Gerhard; and Straubel, Max, to Robert Bosch GmbH. Apparatus for the rpm-dependent adjustment of the timing of an injection pump. 4,566,421, Cl. 123-502.000.

Bauman, Therese M.; and Lee, Chi-Long, to Dow Corning Corporation. Nonslumping, foamable polyorganosiloxane compositions containing organosiloxane graft copolymers. 4,567,212, Cl. 521-122.000.

Baumann, Annegrit; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. 3-Chloro-3-phenylprop-2-enyl thiophosphates and their use for controlling pests. 4,567,170, Cl. 514-128.000.

Baumann, John A.: *See*—
Olego, Diego; Brock, David G.; Baumann, John A.; and Spicer, William E., 4,567,503, Cl. 357-54.000.

Baumeler, Markus, to Sulzer Brothers Limited. Pneumatic servomotor. 4,566,273, Cl. 60-415.000.

Baur, Reinhold: *See*—
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.

Bayer Aktiengesellschaft: *See*—
Blank, Heinz U.; and Wolters, Erich, 4,567,004, Cl. 260-465.00R.
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.
Hammer, Heinz; Kircher, Klaus; and Meyer, Rolf-Volker, 4,567,210, Cl. 521-90.000.
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,567,168, Cl. 514-89.000.
Niemers, Ekkehard; Knorr, Andreas; and Garthoff, Bernward, 4,567,188, Cl. 514-332.000.

Bayerische Motoren Werke AG: *See*—
Gebler, Eugen, 4,567,460, Cl. 340-58.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, 4,567,459, Cl. 340-58.000.

Bazan, Alberto; and Murphy, Donald M. Dual diaphragm pump. 4,566,867, Cl. 417-393.000.

BBC Aktiengesellschaft Brown, Boveri & Cie: *See*—
Hoffeins, Hans; Kalbfuss, Richard; and Ipek, Bora, 4,566,268, Cl. 60-39.463.

BBC Brown, Boveri & Company, Limited: *See*—
Dobsa, Josip; and Hammad, Adel, 4,567,423, Cl. 322-58.000.
Dobsa, Josip; Mauchle, Peter; Pfyl, Walter; and Sadek, Kadry, 4,567,424, Cl. 323-210.000.

Beales, Keith J.; Day, Clive R.; Ainslie, Benjamin J.; and Rush, James D., to British Telecommunications. Optical fibres. 4,566,754, Cl. 350-96.300.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Co. Oil soluble chromium catalyst. 4,567,156, Cl. 502-173.000.

Beasom, James D.: *See*—
Falater, Scott L.; and Beasom, James D., 4,567,385, Cl. 307-443.000.

Beau, Jean F.; and Gauthier, Michel, to Societe Nationale Industrielle et Aerospatiale. Kinetic wheel arrangement incorporating magnetic suspension provided with means for caging its rotor. 4,566,740, Cl. 308-10.000.

Beaver, Richard P.: *See*—
Hostler, Jonathan E.; and Beaver, Richard P., 4,566,890, Cl. 65-12.000.

Becht, Carl T., to Sencorp. Means for associating a driver, constituting a part of a replaceable fastener containing magazine, with the driver operating mechanism of a fastener driving tool. 4,566,621, Cl. 227-109.000.

Beck, James P.; and Luna, Carlos E., to Beckman Instruments, Inc. Method for determining γ-glutamyltransferase activity and kits containing a novel substrate solution for use therein. 4,567,138, Cl. 435-15.000.

Beck, William H., to Ross Hill Controls Corporation. Semi-conductor motor control system. 4,567,420, Cl. 318-803.000.

Becker, Franz-Josef; Hubner, Erich; and Lammerich, Walter, to Zanders Feinpaiere AG. Metallized paper and method of its production. 4,567,098, Cl. 428-327.000.

Beckman Instruments, Inc.: *See*—
Beck, James P.; and Luna, Carlos E., 4,567,138, Cl. 435-15.000.

Beckwith, Bruce R.: *See*—
Kulig, Constantine W.; Kingsbury, Charles M.; and Beckwith, Bruce R., 4,566,894, Cl. 65-304.000.

Bederman, Seymour, to International Business Machines Corp. Message stripping protocol for a ring communication network. 4,567,590, Cl. 370-86.000.

Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, to Imperial Chemical Industries PLC. Process for racemizing certain spiro compounds. 4,567,278, Cl. 548-309.000.

Bednorz, Klaus: *See*—
Hollaus, Reinhard; Zehetbauer, Rudolf; and Bednorz, Klaus, 4,567,316, Cl. 136-246.000.

Beehive Machinery, Inc.: *See*—
McFarland, Archie R.; and Preece, Bruce L., 4,566,640, Cl. 241-74.000.

Bege, Dietmar: *See*—
Friesner, Karl; Bege, Dietmar; Erbse, Dietmar; and Meininger, Siegfried, 4,566,204, Cl. 34-15.000.

Bell Canada: *See*—
Trumble, William P., 4,567,115, Cl. 428-541.000.

Beloit Corporation: *See*—
Ewald, James L.; and Rodal, Jose J. A., 4,566,945, Cl. 162-343.000.

Benchcraft, Inc.: *See*—
Dahlin, Robert D., 4,566,243, Cl. 52-584.000.

Bencuya, Izak; and Cogan, Adrian I., to GTE Laboratories Incorporated. Method of fabricating a static induction type recessed junction field effect transistor. 4,566,172, Cl. 29-571.000.

Bender, Herbert: *See*—
Blinne, Gerd; Bender, Herbert; and Neumann, Peter, 4,567,248, Cl. 528-211.000.

Benjamin, Abraham: *See*—
German, John G.; Benjamin, Abraham; and Stirling, James F., 4,566,336, Cl. 73-772.000.

Benjamin, Kenneth A., to Leesona Corporation. Take-up machine motor control. 4,566,646, Cl. 242-45.000.

Benjamins, Elmo I.: *See*—
Medema, Pieter W.; and Benjamins, Elmo I., 4,566,374, Cl. 99-281.000.

Bennett, Allyn N., to Du Pont de Nemours, E. I., and Company. Cover sheet in a photosensitive element. 4,567,128, Cl. 430-313.000.

Bennison, John J.; Longworth, Stuart W.; and Baker, John G., to Dearborn Chemicals, Ltd. Treatment of aqueous systems. 4,566,972, Cl. 210-698.000.

Benschop, Nico F., to U.S. Philips Corporation. Integrated logic circuit incorporating fast sample control. 4,567,386, Cl. 307-481.000.

Benteler-Werke AG Werk Neuhaus: *See*—
Vaubel, Gert, 4,566,523, Cl. 164-420.000.

Berchtold, Max, to Stanadyne, Inc. Accumulator nozzle fuel injection system. 4,566,416, Cl. 123-458.000.

Berg, Bengt O., to Telefonaktiebolaget LM Ericsson. High input impedance low output impedance amplifier. 4,567,445, Cl. 330-300.000.

Berg, Lloyd; and Yeh, An-I. Separation of isopropyl ether from isopropanol and water by extractive distillation. 4,566,948, Cl. 203-51.000.

Berg, Norman J.: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,566,760, Cl. 350-358.000.

Bergandi Manufacturing Co., Inc.: *See*—
Rohrbacher, Herbert E., 4,566,501, Cl. 140-1.000.

Berger, Hermann; and Ernst, Franz, to Chemie und Filter GmbH Verfahrenstechnik KG. Apparatus for regulating a parameter by admitting an additive into a medium. 4,567,359, Cl. 364-183.000.

Berger, Maurice; Bernasconi, Jean-Francois; and Juillerat, Michel R., to Fabriques de Tabac Reunies, S.A. Apparatus for handling packed goods. 4,566,836, Cl. 414-57.000.

Berger, Terry A., to Hewlett-Packard Company. Method of operating a self cleaning electrochemical detector. 4,566,949, Cl. 204-1.00T.

Bergwerksverband GmbH: *See*—
Knoblauch, Karl; Harder, Burkhard; Heimbach, Heinrich; and Cosentino, Charles F., 4,566,282, Cl. 62-48.000.
Richter, Ekkehard; Knoblauch, Karl; Schlegel, Rolf; and Korbacher, Werner, 4,566,881, Cl. 55-25.000.

Berings, Josephus B. M. Method and a device for controlling a brush-commutator assembly of an electric machine. 4,567,414, Cl. 318-542.000.

Bernard, Alain M.; Le Clerc, Georges-Marie J.; and Foulon, Bernard M., to Office National d'Etudes et de Recherche Aerospatiales (ONERA). Electrostatic-suspension accelerometers. 4,566,328, Cl. 73-517.00B.

Bernasconi, Jean-Francois: *See*—
Berger, Maurice; Bernasconi, Jean-Francois; and Juillerat, Michel R., 4,566,836, Cl. 414-57.000.

Berner, James P.: *See*—
Berner, John M.; Derus, Patricia M.; and Berner, James P., 4,566,440, Cl. 128-25.00R.

Berner, John M.; Derus, Patricia M.; and Berner, James P., to Empi, Inc. Orthosis for leg movement with virtual hip pivot. 4,566,440, Cl. 128-25.00R.

Bernhard, Marcel, to Societe Alsacienne d'Aluminium. Flexible foil material or laminate, particularly for soft packaging and capping. 4,567,112, Cl. 428-461.000.

Bernstein, Jerome D.: *See*—
Faber, Marcel; Bernstein, Jerome D.; and Grossman, Matthew, 4,567,145, Cl. 435-161.000.

Bert, Alain; and Camiade, Marc, to Thomson-CSF. Low noise oscillator operating in the ultra-high frequency range. 4,567,449, Cl. 331-56.000.

Bertsch, Carl F.: *See*—
Pafford, Bernie J.; and Bertsch, Carl F., 4,566,966, Cl. 208-113.000.

Beson, John. Gate valve having a secondary seal. 4,566,671, Cl. 251-159.000.

Bessard, Michel, to Rexroth Sigma. Fluid distributing device, more especially for remote control. 4,566,492, Cl. 137-636.100.

Bethlehem Steel Corporation: *See*—
Keiper, Tilghman H., Jr., 4,566,630, Cl. 238-292.000.

Bettinger, Guenter; Pfefferkorn, Dietmar; and Pavelka, Bozidar, to BASF Aktiengesellschaft. Tape cassette comprising a substantially rectangular two-part housing. 4,566,653, Cl. 242-199.000.

BGB-Gesellschaft Reinmar John & Rainer Leo Meyer: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,567,230, Cl. 524-786.000.

Bhatia, Yog R.; and Stallworth, Herman, to Videojet Systems International, Inc. Ink jet printing composition. 4,567,213, Cl. 523-160.000.

BICC Public Limited Company: *See*—
McKenna, Owen P., 4,566,303, Cl. 72-262.000.

Bierwirth, Adolf P.; and Zielinski, Erich, to Rheinmetall GmbH. Loading tray mechanism for a tank cannon. 4,566,369, Cl. 89-45.000.

Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, to Synthelabo. Imidazoline derivatives as α_2-antagonists. 4,567,177, Cl. 514-214.000.

Bihler, Franz; and Abele, Anton, to Kleindienst GmbH. Easy-adjust stair climber for wheelchair. 4,566,706, Cl. 280-5.220.

Billingsley, Henry C.; and DuBois, Chester G., to Outboard Marine Corporation. Flexible coupling for carburetors. 4,566,424, Cl. 123-583.000.

Binning, Ronald L.; and Sieder, Burton C., to Intech Systems, Inc. Accumulator pan transfer device. 4,566,838, Cl. 414-278.000.

Binsack, Rudolf: *See*—
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.

Bio Mobuchi Co. Ltd.: *See*—
Mabuchi, Kenichi; and Yagi, Masao, 4,566,442, Cl. 128-52.000.

Birkenbach, Alfred, to ITT Industries, Inc. Pressurized fluid supplying arrangement particularly a master cylinder of a clutch. 4,566,277, Cl. 60-587.000.

Bishop, Mary F.: *See*—
Meska, Robert J.; and Bishop, Mary F., 4,566,666, Cl. 248-558.000.

Bittner, Helmut; Gottzein, Eveline; and Surauer, Michael, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Arrangement for the attitude stabilization of flexible vehicles with weakly-dampened structural vibrations and discontinuous control intervention. 4,567,564, Cl. 364-434.000.

Bizot, Henri; Dautremont, Jean; and Sylvian, Alain, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.". Process and apparatus for the precision measurement of rotor blade-height. 4,566,225, Cl. 51-165.720.

Bjorshol, Kolbjorn. Apparatus for the release of a fish hook from a snood head. 4,566,215, Cl. 43-4.000.

Black, John W.: *See*—
Acree, William M.; Edwards, Bobby; and Black, John W., 4,567,042, Cl. 424-89.000.
Acree, William M.; Edwards, Bobby; and Black, John W., 4,567,043, Cl. 424-89.000.

Blackmore, Phillip W.; Fletcher, William T.; and Burn, Terry B., to Fiberglas Canada Inc. Process and apparatus to crimp fibres. 4,567,078, Cl. 428-119.000.

Blanchard, Randall D., to John Fluke Mfg. Co., Inc. Touch-sensitive overlay. 4,567,480, Cl. 340-712.000.

Blank, Heinz U.; and Wolters, Erich, to Bayer Aktiengesellschaft. Process for the preparation of monomethyl-substituted methylene compounds. 4,567,004, Cl. 260-465.00R.

Blazer International Corp.: *See*—
Lemme, Charles D., 4,567,549, Cl. 362-279.000.

Blindheim, Ulf; Haegh, Gerd S.; and Nilsen, Bjorn P., to Sentralinstitutt for Industriell Forskning. Method for isomerizing alkylbenzenes. 4,567,313, Cl. 585-480.000.

Blinne, Gerd; Bender, Herbert; and Neumann, Peter, to BASF Aktiengesellschaft. Branched, high molecular weight, thermoplastic polyarylene ethers containing nitrile groups, and their preparation. 4,567,248, Cl. 528-211.000.

Blohm & Voss AG: *See*—
Friederichs, Karl-Heinz; and Schlapkohl, Joachim, 4,567,415, Cl. 318-565.000.

Blonder, Isaac S.: *See*—
Scherer, George; Joswick, Walter; and Blonder, Isaac S., 4,567,516, Cl. 358-114.000.

Blonder-Tongue Laboratories, Inc.: *See*—
Scherer, George; Joswick, Walter; and Blonder, Isaac S., 4,567,516, Cl. 358-114.000.

Bloom, William G.; and Geschwind, Gary I., to Raychem Corporation. Method for making bi-polar electrocautery needle. 4,566,183, Cl. 29-825.000.

Bloomer, Milton D., to General Electric Company. Method of and apparatus for half-cycle-average or R.M.S. load voltage control. 4,567,425, Cl. 323-237.000.

Blum, David B.: *See*—
Mednick, R. Lawrence; and Blum, David B., 4,567,204, Cl. 518-700.000.

Bochinski, Rolf; Eimer, Klaus; Littek, Harald; and Nasse, Johannes, to Taprogge Gesellschaft mbH. Apparatus for cleaning heat exchanger pipes and methods of operating an apparatus of this type. 4,566,533, Cl. 165-95.000.

Bode, Albert: *See*—
Buhler, Ulrich; Tappe, Horst; Bode, Albert; Hahnke, Manfred; and Roth, Kurt, 4,567,252, Cl. 534-882.000.

Bodine, Albert G. Sonic device for extracting minerals from ore. 4,566,800, Cl. 366-118.000.

Boehmer, Dennis A.: *See*—
Edwards, Floyd V.; and Boehmer, Dennis A., 4,566,493, Cl. 137-346.000.

Boehringer Mannheim GmbH: *See*—
Batz, Hans-George, 4,567,139, Cl. 435-28.000.

Boeing Company, The: *See*—
Konsevich, Francis X., 4,566,231, Cl. 52-145.000.
Therrien, Keith E., 4,567,076, Cl. 428-102.000.

Boekhorst, Frederick M.: *See*—
Stroomer, Martinus V. C.; and Boekhorst, Frederick M., 4,567,522, Cl. 358-158.000.

Boese, Roland, to Nicolet Instrument Corporation. Low temperature device for cooling small samples. 4,566,283, Cl. 62-49.000.

Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, to BASF Aktiengesellschaft. Process and apparatus for preparing or reacting alkanolamines. 4,567,303, Cl. 564-475.000.

Bogl, Emil: *See*—
Rotte, Hermann J.; and Bogl, Emil, 4,566,479, Cl. 137-312.000.

Bohrer, Philip J., to Honeywell, Inc. Fluid flow sensing means with ambient temperature compensation. 4,566,320, Cl. 73-204.000.

Bold, William A.: *See*—
Bauer, Charles E.; and Bold, William A., 4,566,186, Cl. 29-852.000.

Bolenbaugh, Daniel L.; and Herzog, Robert E., to Allied Corporation. Disc brake assembly. 4,566,564, Cl. 188-73.330.

Bolhofer, William A.: *See*—
Baldwin, John J.; Pietruszkiewicz, Adolph; Bolhofer, William A.; and Lumma, William C., Jr., 4,567,191, Cl. 514-362.000.

Boliden Aktiebolag: *See*—
Allgulin, Torkel, 4,566,975, Cl. 210-711.000.

Bomgardner, Charles T., to Halliburton Company. Cushioning unit shaft seal. 4,566,701, Cl. 277-58.000.

Bonadeo, Igino. Cosmetics integrated with epicutaneous sebum and sebum-like compositions. 4,567,203, Cl. 514-844.000.

Bonnaud, Bernard: *See*—
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,567,288, Cl. 560-37.000.

Boothe, Leland H., to Little Giant Industries, Inc. Ladder hinge and multi-position locking mechanism therefor. 4,566,150, Cl. 16-332.000.

Borg, Siegbert, to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft. Method of regenerating alkali-containing wash solutions utilized for cleaning containers. 4,566,912, Cl. 134-13.000.

Borio, Donald C.; Borio, Richard W.; Hale, Gilbert L.; Mehta, Arun K.; and Tyler, Arnold L., to Combustion Engineering, Inc. Integrated coal cleaning process. 4,566,394, Cl. 110-347.000.

Borio, Richard W.: *See*—
Borio, Donald C.; Borio, Richard W.; Hale, Gilbert L.; Mehta, Arun K.; and Tyler, Arnold L., 4,566,394, Cl. 110-347.000.

Bos, Philip J., to Tektronix, Inc. Rapid starting, high-speed liquid crystal variable optical retarder. 4,566,758, Cl. 350-346.000.

Bosdet, Charles L. Mount for supporting camera having elongated lens. 4,566,768, Cl. 354-81.000.

Bosshard, Ernst, to Sulzer Brothers Limited. Frame for storing nuclear fuel elements. 4,567,015, Cl. 376-272.000.

Bottcher, Rolf; and Lindner, Hans-Jurgen, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Collating machine with error-indicating rejection device. 4,566,681, Cl. 270-58.000.

Bourgoin, Alain: *See*—
Bailly, Francois P.; Bourgoin, Alain; and Israel, Renato, 4,567,329, Cl. 179-18.0FA.

Bowlin, Stanley L., to North American Philips Corporation. Method of trimming precision resistors. 4,566,936, Cl. 156-627.000.

Bowyer, Edward E., to Ethyl Molded Products Company. Self-draining closure. 4,566,508, Cl. 141-381.000.

Boyd, Barry S. Directional controller apparatus for a video or computer input. 4,567,479, Cl. 340-709.000.

Boykin, John C., to Electronic Flo-Meters, Inc. Pipeline flow measurement proving system. 4,566,307, Cl. 73-3.000.

Bozarth, Theodore B.; Demark, Anthony M.; Finn, Edward F.; and Lynch, Frank, to Honeywell Inc. Sensor communication system. 4,567,466, Cl. 340-347.0AD.

Brackmann, Warren A., to Rothmans of Pall Mall Canada Limited. Tobacco leaf processing. 4,566,470, Cl. 131-312.000.

Brady, Leon; and Spector, George. Long rulers. 4,566,200, Cl. 33-161.000.

Brainard, Ron P.; and Cassidy, L. Wayne, to Murfin Incorporated. Article exhibiting apparent luminescence and its method of manufacture. 4,567,072, Cl. 428-40.000.

Brand, Elizabeth: *See*—
Ciaudelli, Joseph P.; and Brand, Elizabeth, 4,567,038, Cl. 424-59.000.

Brand-Rex Company: *See*—
Johnston, James J., 4,566,749, Cl. 339-95.00D.

Brands, George, to American Roller Company. Stretcher/expander roller. 4,566,162, Cl. 26-105.000.

Brandt, Siegfried: *See*—
Panoch, Hans J.; Feldmann, Rainer; Hinn, Hans; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,566,931, Cl. 156-330.900.

Brandyberry, Dennis R.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Metallic cable and apparatus for manufacturing the same. 4,566,261, Cl. 57-212.000.

Brasen, Daniel; DiGiuseppe, Michael A.; Lourenco, Jose A.; and Mahajan, Subhash, to AT&T Bell Laboratories. Cleaning technique for LPE melt ingots. 4,566,934, Cl. 156-622.000.

Braun Aktiengesellschaft: *See*—
Lang, Gerhard, 4,567,476, Cl. 340-636.000.

Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, to WABCO Westinghouse Steuerungstechnik GmbH & Co. Variable point position determining arrangement. 4,566,196, Cl. 33-125.00R.

Break, Douglas G.: *See*—
Van Cleave, Eugene H.; and Break, Douglas G., 4,566,304, Cl. 72-319.000.

Breiholz, Arlen E., to Rockwell International Corporation. Phase difference measurement technique for VOR. 4,567,486, Cl. 343-401.000.

Breneman Company, The: *See*—
Simon, Terry L., 4,566,517, Cl. 160-263.000.

Brennan, William E.: *See*—
Gavagan, James A.; and Brennan, William E., 4,566,160, Cl. 24-637.000.

Brentham, Jerry D. Computerized exercising device. 4,566,692, Cl. 272-130.000.

Brewin, Alfred R., III: *See*—
Cramer, Clarence W.; and Brewin, Alfred R., III, 4,566,506, Cl. 141-160.000.

Brewin, Nicholas J.; and Johnston, Andrew W. B., to National Research Development Corporation. Synthetic plasmid and bacteria containing it. 4,567,146, Cl. 435-172.300.

Brewster, Andrew G.; and Caulkett, Peter W. R., to Imperial Chemical Industries PLC. 1,3-Dioxan-5-ylalkenoic acids. 4,567,197, Cl. 514-452.000.

Briar, Thomas J.; and Retsch, William H., to PPG Industries, Inc. Fin cooler clamp. 4,566,891, Cl. 65-12.000.

Bristol, Lloyd R., to Tektronix, Inc. Oscillographic device for displaying multiple continuous waveforms. 4,567,405, Cl. 315-392.000.

Bristol-Myers Company: *See*—
Matson, James A., 4,567,143, Cl. 435-119.000.
Vyas, Dolatrai M.; Kaneko, Takushi; and Doyle, Terrence W., 4,567,256, Cl. 544-58.200.

British Gas Corporation: *See*—
Collingwood, John C., 4,566,332, Cl. 73-639.000.

British Petroleum Company p.l.c., The: *See*—
Diaz, Henri; Jorgensen, Pierre; and Vernet, Pierre, 4,566,961, Cl. 204-168.000.
Hockley, Peter J.; and Thwaites, Michael J., 4,567,499, Cl. 357-2.000.
Nay, Barry; and Stewart, David G., 4,567,160, Cl. 502-326.000.

British Telecommunications: *See*—
Beales, Keith J.; Day, Clive R.; Ainslie, Benjamin J.; and Rush, James D., 4,566,754, Cl. 350-96.300.
Mountain, Peter J., 4,567,601, Cl. 375-22.000.

Britt, James E.; Laskowski, Kenneth W.; Sisson, Jeffrey L.; and Rinehart, Stephen A., to Xerox Corporation. Very high speed duplicator with finishing function using dual copy set transports. 4,566,782, Cl. 355-14.0SH.

Brittain, David R.: *See*—
Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, 4,567,278, Cl. 548-309.000.

Broadfoot, William D.: *See*—
Egan, Paul F.; Broadfoot, William D.; and Alden, Peter, 4,566,820, Cl. 404-14.000.

Brock, David G.: *See*—
Olego, Diego; Brock, David G.; Baumann, John A.; and Spicer, William E., 4,567,503, Cl. 357-54.000.

Brockelsby, Norman D. Variable speed transmission for portable winch. 4,566,872, Cl. 474-101.000.

Brodsky, Marc H.; and Weinberg, Zeev A., to International Business Machines Corporation. Rapid thermal annealing of silicon dioxide for reduced electron trapping. 4,566,913, Cl. 148-1.500.

Bronson, James C.; and Wright, Donald C., Jr., to Lakeland Rubber Stamp Company, Inc. Line coder system for use on either side of conveyor line. 4,566,382, Cl. 101-35.000.

Brooks, George D.: *See*—
Aloi, Anthony J.; Brooks, George D.; and Prince, Ronald E., 4,566,580, Cl. 193-48.000.

Brossman, Harold A., Jr. Device to discourage growth of respiratory viruses. 4,566,450, Cl. 128-200.110.

Brotton, James: *See*—
Wilman, Hugh; and Brotton, James, 4,567,528, Cl. 358-285.000.

Brotzmann, Karl: *See*—
von Bogdandy, Ludwig; and Brotzmann, Karl, 4,566,904, Cl. 75-38.000.

Brouwer, Marius S.; and Grosscurt, Arnoldus C., to Duphar International Research B.V. Composition active against mites, whitefly and thrips, pharmaceutical composition, and new benzoylurea compounds. 4,567,295, Cl. 564-44.000.

Brown, Boveri & Cie AG: *See*—
Klein, Erwin, 4,566,529, Cl. 165-32.000.

Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., to AMP Incorporated. Apparatus for connecting electrical connectors to flat multi-conductor cable. 4,566,164, Cl. 29-33.00M.

Brown de Colstoun, Francois P. D.; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; Moscovici, Jean-Claude M.; and Moscovici, Michel. Method for detecting a source of heat, more particularly a forest fire in a watched area, and system for carrying out said method. 4,567,367, Cl. 250-340.000.

Brown, Keith C.; and Corbett, John F., to Clairol Incorporated. Metaphenylenediamine coupler compounds and oxidative hair dye compositions and methods using same. 4,566,876, Cl. 8-411.000.

Brown, Richard K., to James River-Norwalk, Inc. Side vented and shielded microwave pizza carton. 4,567,341, Cl. 219-10.55E.

Brown, Ronald L.: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,566,167, Cl. 29-437.000.

Brown, Thomas H., to Smith Kline & French Laboratories Limited. 4H-Imidazol-4-ones and their pharmaceutical use. 4,567,176, Cl. 514-212.000.

Brown, Trevor P., to Pandrol Limited. Electrically insulating railway rails from rail-fastening means. 4,566,631, Cl. 238-349.000.

Brown & Williamson Tobacco Corporation: *See*—
Sachleben, Leroy R.; Korte, Kevin R.; Snyder, Daniel D.; and Allen, Terry L., 4,566,468, Cl. 131-297.000.

Brumen, Claudio, to United Technologies Corporation. Locking of rotor blades on a rotor disk. 4,566,857, Cl. 416-220.00R.

Bruner, Andrew L. Adjustable boat seat pedestal. 4,566,734, Cl. 297-346.000.

Bruney, Paul F.; and Bugash, Robert S., to Stereo Concepts, Inc. Stereo image recovery. 4,567,607, Cl. 381-1.000.

Brunier-Coulin, Charles, to Somfy. Device for controlling an electric motor. 4,567,416, Cl. 318-602.000.

Bruno, Leonard C.; and Bruno, Mark M., to Applied Biochemists, Inc. Method of cleaning using liquid compositions comprising stabilized mixtures of enzymes. 4,566,985, Cl. 252-174.120.

Bruno, Mark M.: *See*—
Bruno, Leonard C.; and Bruno, Mark M., 4,566,985, Cl. 252-174.120.

Bryan, Horace. Device and method for firming-up a plug-socket connection. 4,566,185, Cl. 29-845.000.

Brzozowski, Jan. Method for the mounting of gems and resulting product. 4,566,294, Cl. 63-15.000.

Bucher, Heinz, to Metronic Electronic GmbH. Air bubble hydromassaging apparatus. 4,566,443, Cl. 128-66.000.

Buckingham, Amyand D.; and Shelton, David P., to National Research Development Corporation. Laser apparatus. 4,567,596, Cl. 372-22.000.

Buckley, John T., to Holland Hitch Company. Fifth wheel. 4,566,715, Cl. 280-434.000.

Buczek, Carl J., to Ford Aerospace & Communications Corporation. Detector array. 4,566,788, Cl. 356-4.000.

Budapesti Muszaki Egyetem: *See*—
Greguss, Pal, 4,566,763, Cl. 350-441.000.

Bugash, Robert S.: *See*—
Bruney, Paul F.; and Bugash, Robert S., 4,567,607, Cl. 381-1.000.

Buhler, Ulrich; Tappe, Horst; Bode, Albert; Hahnke, Manfred; and Roth, Kurt, to Cassella Aktiengesellschaft. Water-insoluble naphthol monoazo dyestuff. 4,567,252, Cl. 534-882.000.

Bukowiecki, Stanislaw; Pfister, Gustav; Reis, Alfons; Troup, Alan P.; and Ulli, Hans-Peter, to Cerberus AG. Gas or vapor alarm system including scanning gas sensors. 4,567,475, Cl. 340-634.000.

Buller, Michael J.: *See*—
Ballard, John R.; Timmis, Peter H.; and Buller, Michael J., 4,566,270, Cl. 60-264.000.

Buol, Douglas A.; Mize, Dean N.; Pattschull, John W.; and Wallace, Robert M., to Texas Instruments Incorporated. Apparatus for testing integrated circuits. 4,567,432, Cl. 324-158.00F.

Burdick, William S.: *See*—
Mehl, Thomas L.; and Burdick, William S., 4,566,454, Cl. 128-303.130.

Burgard, Jeffrey E.: *See*—
Greenwood, Arthur R.; Burgard, Jeffrey E.; and Throndson, Roger L., 4,567,023, Cl. 422-192.000.

Burgess, Douglas: *See*—
Williams, Gilmer A.; and Burgess, Douglas, 4,566,498, Cl. 139-26.000.

Burgin, Kermit H. Acrylooptic examination device with auxiliary light. 4,566,439, Cl. 128-6.000.

Burke, Edmund T. Crutch. 4,566,474, Cl. 135-69.000.

Burn, Terry B.: *See*—
Blackmore, Phillip W.; Fletcher, William T.; and Burn, Terry B., 4,567,078, Cl. 428-119.000.

Burns, Martin J. Building intelligence system. 4,567,557, Cl. 364-145.000.

Burns, Morrison R., Jr.: *See*—
Smith, Hubert E.; Wall, William A.; and Burns, Morrison R., Jr., 4,567,348, Cl. 219-124.340.

Buro Patent AG: *See*—
Pforte, Karl W., 4,566,390, Cl. 104-88.000.

Burr-Brown Corporation: *See*—
Naylor, Jimmy R., 4,567,463, Cl. 340-347.0DA.

Burr, Donald N. Gas turbine engine combustor splash ring construction. 4,566,280, Cl. 60-757.000.

Burroughs Corp.: *See*—
Carrasco, Francis P.; DeRome, Gerard A.; and Fernekes, David W., 4,567,328, Cl. 179-2.00A.
Corey, Philip D.; and Atkins, Elise T., 4,567,379, Cl. 307-270.000.
Deodhar, Shirish P., 4,567,594, Cl. 371-38.000.
Fassbender, Charles J., 4,567,562, Cl. 364-200.000.

Bush, Rodney D., to Procter & Gamble Company, The. Ether polycarboxylates. 4,566,984, Cl. 252-140.000.

Butler, Robert M., to Microglass, Inc. Semiconductor wafer diffusion boat and method. 4,566,839, Cl. 414-404.000.

Buxton, Inc.: *See*—
Friedman, Harvey W.; Kohli, Jerry L.; and DeMur, Cynthia L., 4,566,721, Cl. 281-31.000.

California Institute of Technology: *See*—
Grubbs, Robert H.; and Gilliom, Laura R., 4,567,244, Cl. 526-160.000.

Camco, Incorporated: *See*—
Going, Walter S., III, 4,566,534, Cl. 166-66.400.
Pringle, Ronald E.; and Eatwell, William D., 4,566,540, Cl. 166-317.000.

Camiade, Marc: *See*—
Bert, Alain; and Camiade, Marc, 4,567,449, Cl. 331-56.000.

Campbell Soup Company: *See*—
Cramer, Clarence W.; and Brewin, Alfred R., III, 4,566,506, Cl. 141-160.000.

Campin, Joseph C. Bucket for material. 4,566,844, Cl. 414-726.000.

Canadian Patents and Development Limited: *See*—
Kato, Shuzo; and Feher, Kamilo, 4,567,602, Cl. 375-60.000.

Canadian Patents & Development Ltd. Societe Canadienne des Brevets et d'Exploitation Limited: *See*—
German, John G.; Benjamin, Abraham; and Stirling, James F., 4,566,336, Cl. 73-772.000.

Canfield, V. Robert; Woodring, William J.; and Kubiak, Mira C., to GAF Corporation. High-strength built-up roofing using improved ply sheets. 4,567,079, Cl. 428-131.000.

Canon Kabushiki Kaisha: *See*—
Furukawa, Hideaki, 4,566,547, Cl. 177-46.000.
Honda, Haruhisa; Onoda, Shigeyoshi; and Nishino, Fumio, 4,566,777, Cl. 355-3.00R.
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,567,493, Cl. 346-140.00R.
Kaneda, Naoya, 4,566,773, Cl. 354-403.000.
Maetani, Masami, 4,566,654, Cl. 242-204.000.
Ogawa, Masahiko, 4,567,409, Cl. 318-327.000.
Ohtaka, Keiji; Suzuki, Takashi; Iizuka, Kiyoshi; and Mizutani, Hidemasa, 4,567,123, Cl. 430-4.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,567,127, Cl. 430-65.000.
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.
Sekine, Kazumi, 4,567,354, Cl. 235-145.00R.
Takayama, Makoto; Muramoto, Tomotaka; and Nishimura, Akimasa, 4,567,509, Cl. 358-29.000.
Tanaka, Nobuyoshi; Hashimoto, Seiji; and Kuwayama, Tetsuro, 4,567,510, Cl. 358-44.000.
Tsuda, Shin, 4,567,322, Cl. 179-2.00A.
Tsunekawa, Tokuichi, 4,566,775, Cl. 354-432.000.
Uehara, Haruo, 4,566,930, Cl. 156-280.000.
Yokomizo, Yoshikazu, 4,567,527, Cl. 358-282.000.

Canyon Materials Research & Engineering: *See*—
Wu, Che-Kuang, 4,567,104, Cl. 428-410.000.

Caputo, Jeffrey C.: *See*—
Caputo, Mario A.; and Caputo, Jeffrey C., 4,566,597, Cl. 211-87.000.

Caputo, Mario A.; and Caputo, Jeffrey C. Modular support unit. 4,566,597, Cl. 211-87.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Schwab, Klaus, 4,567,478, Cl. 340-705.000.

Carlin, Lawrence: *See*—
Vensko, George; Carlin, Lawrence; Potter, John; and Smith, Allen R., 4,567,606, Cl. 381-43.000.

Carlsen, W. John; and Melman, Paul, to GTE Laboratories Incorporated. Birefringent optical wavelength multiplexer/demultiplexer. 4,566,761, Cl. 350-401.000.

Carlson, William G.: *See*—
Radford, Kenneth C.; and Carlson, William G., 4,566,989, Cl. 252-478.000.

Carossino, Patricia. Universal tool-holder. 4,566,357, Cl. 81-177.200.

Carpenter, James H., Jr., to Kennecott Corporation. Impact blasting system for etching metal surfaces. 4,566,230, Cl. 51-420.000.

Carr, William N., to Recognition Equipment Incorporated. Semiconductor device for automation of integrated photoarray characterization. 4,567,430, Cl. 324-158.00D.

Carrasco, Francis P.; DeRome, Gerard A.; and Fernekes, David W., to Burroughs Corp. Energy detection circuit for a facsimile system controller. 4,567,328, Cl. 179-2.00A.

Carrier Corporation: *See*—
Pandeya, Prakash N.; and Chu, Tsuwei, 4,566,869, Cl. 418-15.000.
Stewart, Robert S., 4,567,390, Cl. 310-68.00C.

Cars & Concepts, Inc.: *See*—
Theodore, Chris P., 4,566,728, Cl. 296-76.000.

Cartwright, Willard E., to Kliklok Corporation. Carton transfer apparatus with effective constant length inverting arm. 4,566,846, Cl. 414-742.000.

Casals-Stenzel, Jorge: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,567,195, Cl. 514-419.000.

Casio Computer Co., Ltd.: *See*—
Arai, Yoneaki, 4,566,363, Cl. 84-1.080.
Yamada, Shigeru, 4,567,360, Cl. 235-455.000.

Casseday, Michael W.: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,566,760, Cl. 350-358.000.

Cassella Aktiengesellschaft: *See*—
Buhler, Ulrich; Tappe, Horst; Bode, Albert; Hahnke, Manfred; and Roth, Kurt, 4,567,252, Cl. 534-882.000.

Cassidy, L. Wayne: *See*—
Brainard, Ron P.; and Cassidy, L. Wayne, 4,567,072, Cl. 428-40.000.

Castelli, Fabio: *See*—
Villa, Ferruccio; and Castelli, Fabio, 4,566,599, Cl. 212-160.000.

Castera, Jean P.; and Meunier, Paul L., to Thomson CSF. Vectorial force sensor with elastic surface waves. 4,566,329, Cl. 73-597.000.

Catrain, Yves; Guerrier, Claude; and Revol, Jacques, to SCAL Societe de Conditionnements en Aluminium. Composite material and its application to reinforcement in insulating panels. 4,567,092, Cl. 428-246.000.

Caulfield, Henry J.; and Rhodes, William T., to Battelle Development Corporation. Optical systolic array processing. 4,567,569, Cl. 364-845.000.

Caulkett, Peter W. R.: *See*—
Brewster, Andrew G.; and Caulkett, Peter W. R., 4,567,197, Cl. 514-452.000.

Cavanaugh, Glenn L.; and Raffield, William C., to Trio Corporation; and Cavanaugh Marine Corp. Crew boat. 4,566,397, Cl. 114-56.000.

Cavanaugh Marine Corp.: *See—*
Cavanaugh, Glenn L.; and Raffield, William C., 4,566,397, Cl. 114-56.000.

Celanese Corporation: *See—*
David, Lawrence D.; and Arons, Richard M., 4,567,101, Cl. 428-364.000.
Gajria, Chandrasen; and Ozari, Yehuda, 4,567,246, Cl. 526-318.440.
Kiss, Gabor D., 4,567,227, Cl. 524-538.000.
Yoon, Hyun-Nam, 4,567,247, Cl. 528-190.000.

Celluloid S.A.: *See—*
Wachtel, Jean-Louis, 4,566,145, Cl. 15-201.000.

CEM Corporation: *See—*
Collins, Michael J.; and Goetchius, Ronald J., 4,566,312, Cl. 73-32.00A.
Collins, Michael J.; and Hargett, Wyatt P., Jr., 4,566,804, Cl. 374-14.000.

Cerberus AG: *See—*
Bukowiecki, Stanislaw; Pfister, Gustav; Reis, Alfons; Troup, Alan P.; and Ulli, Hans-Peter, 4,567,475, Cl. 340-634.000.

Cetus Corporation: *See—*
Neidleman, Saul L.; and Ervin, Jacqueline L., 4,567,144, Cl. 435-134.000.

Chaki, Takao, to Clarion Co., Ltd. Clutch mechanism in pushbutton tuner. 4,566,344, Cl. 74-10.330.

Chakraborty, Utpal R.: *See—*
Musser, John H.; and Chakraborty, Utpal R., 4,567,184, Cl. 514-277.000.

Chalke, Brian J.: *See—*
French, Geoffrey R.; Peltret, Pierre H.; and Chalke, Brian J., 4,566,271, Cl. 60-286.000.

Chambaret, Jean-Paul: *See—*
Brown de Colstoun, Francois P. D.; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; Moscovici, Jean-Claude M.; and Moscovici, Michel, 4,567,367, Cl. 250-340.000.

Chambaret, Yves: *See—*
Brown de Colstoun, Francois P. D.; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; Moscovici, Jean-Claude M.; and Moscovici, Michel, 4,567,367, Cl. 250-340.000.

Chamberlin, James W.: *See—*
Gray, James S.; Chamberlin, James W.; McBride, Alan L.; and Schreiner, Peter G., III, 4,567,591, Cl. 370-109.000.

Chan, Wan-kit, to USV Pharmaceutical Corp. Diarylhydroxy alkanones and alkenones antiallergy agents. 4,567,279, Cl. 548-491.000.

Chandra, Satish: *See—*
Dolsen, Philip C.; Chandra, Satish; Hammon, Gordon R.; and Uren, William J., 4,567,482, Cl. 340-825.050.

Chang, Long F., to Owens-Illinois, Inc. Plastic container. 4,566,600, Cl. 215-1.00C.

Charles C. Worth Corporation: *See—*
Young, John N., 4,566,655, Cl. 242-215.000.

Charles, Isabel; and Robinson, Malcolm, to E. R. Squibb & Sons, Inc. Esters of diatrizoic acid as X-ray contrast agents. 4,567,034, Cl. 424-5.000.

Charpak, Georges: *See—*
Lewiner, Jacques; and Charpak, Georges, 4,567,530, Cl. 358-295.000.

Charveron, Marie: *See—*
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,567,288, Cl. 560-37.000.

Chauveau, Jean-Marc; and Schmitt, Michel, to Lucas Industries Limited. Combined live axles and brake assemblies for vehicles. 4,566,563, Cl. 188-18.00A.

Chavanoz S.A.: *See—*
Durand, Marc, 4,566,259, Cl. 57-6.000.

Chem Systems, Inc.: *See—*
Mednick, R. Lawrence; and Blum, David B., 4,567,204, Cl. 518-700.000.

Chemie und Filter GmbH Verfahrenstechnik KG: *See—*
Berger, Hermann; and Ernst, Franz, 4,567,559, Cl. 364-183.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Panoch, Hans J.; Feldmann, Rainer; Hinn, Hans; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,566,931, Cl. 156-330.900.
Schuler, Ralf; and Maahs, Gunther, 4,567,220, Cl. 524-413.000.

Chemplex Company: *See—*
Pullukat, Thomas J.; Hwang, Yu-Tang; and Dombro, Robert A., 4,567,243, Cl. 526-128.000.

Chen, Kun S. Method for fixing electric cord and an electrical connector. 4,566,187, Cl. 29-857.000.

Chen, Timothy S.: *See—*
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, 4,567,301, Cl. 564-243.000.

Cheng, Chung-Heng: *See—*
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, 4,567,301, Cl. 564-243.000.

Chenoweth, David V.: *See—*
Baker, John R.; Chenoweth, David V.; and McStravick, David M., 4,566,495, Cl. 138-149.000.

Chernysh, Mikhail M.: *See—*
Vinogradov, Georgy V.; Deinega, Jury F.; Yanovsky, Jury G.; Vasilieva, Olga V.; Konstantinov, Alexandr A.; and Chernysh, Mikhail M., 4,566,324, Cl. 73-60.000.

Chesnut, M. Gaines. Cartridge clip. 4,566,212, Cl. 42-50.000.

Chevron Research Company: *See—*
Bacskai, Robert, 4,567,154, Cl. 502-114.000.
DeVires, Louis; and Ryason, P. R., 4,567,311, Cl. 585-415.000.
Miller, Stephen J.; and Pandey, Sue D., 4,567,312, Cl. 585-419.000.
Schmadel, Donald C., Jr., 4,566,889, Cl. 65-3.200.
Schneider, Ronald A., 4,566,988, Cl. 252-373.000.

Chia, E. Henry; and Adams, Ronald D., to Southwire Company. Method of and apparatus for casting a compound metal bar. 4,566,524, Cl. 164-461.000.

Chiba Prefectural Government: *See—*
Ooi, Kiyoshi; Morita, Michio; Suzuki, Kazuyoshi; Hashizume, Soh; and Yoshizawa, Hanako, 4,567,147, Cl. 435-237.000.

Chille, Joseph R.: *See—*
Streeper, Leonard W.; and Chille, Joseph R., 4,566,154, Cl. 19-296.000.

Choate, Albert G., to Automation Gages, Inc. Multi-directional surface illuminator. 4,567,551, Cl. 362-398.000.

Choi, Charles H.: *See—*
Jelsma, Richard K.; Choi, Charles H.; and Hynes, Thomas G., 4,566,445, Cl. 128-70.000.

Chorvat, Robert J.; Prodan, Kathleen A.; and Schulz, John A., to G. D. Searle & Co. Hexahydroindolizinones useful for treating cardiac arrhythmia, thrombotic disorders in mammals. 4,567,270, Cl. 546-183.000.

Chow, Peter C. M.; and Connolly, Walter L., to Grove Valve and Regulator Company. Multi-stage pressure reducing system. 4,566,488, Cl. 137-613.000.

Chu Associates, Inc.: *See—*
Creaser, Charles W., Jr., 4,567,487, Cl. 343-900.000.

Chu, Kwo R.: *See—*
Barnett, Larry R.; Lau, Yue-Ying; Chu, Kwo R.; and Granatstein, Victor L., 4,567,401, Cl. 315-5.000.

Chu, Tsuwei: *See—*
Pandeya, Prakash N.; and Chu, Tsuwei, 4,566,869, Cl. 418-15.000.

Chubachi, Noriyoshi; Kushibiki, Junichi; and Nakanishi, Kouichi, to Honda, Keisuke; Chubachi, Noriyoshi; and Kushibiki, Junichi. Focusing ultrasonic transducer element. 4,566,333, Cl. 73-642.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Kumano, Masafumi; Kawashima, Ikue; Hirama, Masayuki; and Tsuji, Yasuhiro, 4,566,453, Cl. 128-303.100.

Chugoku Marine Paints (USA) Inc.: *See—*
McGinniss, Vincent D.; and Dick, Richard J., 4,566,906, Cl. 106-15.050.

Ciaudelli, Joseph P., to Revlon, Inc. Fatty acid diesters. 4,567,037, Cl. 424-59.000.

Ciaudelli, Joseph P.; and Brand, Elizabeth, to Revlon, Inc. Sunscreen composition for hair protection. 4,567,038, Cl. 424-59.000.

Ciba-Geigy Corporation: *See—*
Gehret, Jean-Claude; and Traber, Walter, 4,567,190, Cl. 514-343.000.
Holzle, Gerd; Miotto, Mirella; Reinert, Gerhard; and Polony, Rudolf, 4,566,874, Cl. 8-103.000.
Mangum, Thomas M., 4,567,171, Cl. 514-150.000.
Martin, Henry; and Fricker, Urs, 4,566,901, Cl. 71-105.000.
Nyfeler, Robert, 4,567,052, Cl. 426-532.000.

Cibie Projecteurs: *See—*
Stephano, Marc, 4,567,550, Cl. 362-297.000.

Cipriano, Robert A., to Dow Chemical Company, The. Electrochemical conversion of soluble salts of insoluble acids to their acid form. 4,566,956, Cl. 204-72.000.

Citizen Watch Co., Ltd.: *See—*
Kimura, Sosaku, 4,566,226, Cl. 51-165.720.

Claas Ohg: *See—*
Clostermeyer, Gerhard; and Muller, Werner, 4,566,380, Cl. 100-89.000.

Clairol Incorporated: *See—*
Brown, Keith C.; and Corbett, John F., 4,566,876, Cl. 8-411.000.
Varco, Joseph J.; and Williams, Carl E., 4,567,040, Cl. 424-70.000.

Clarion Co., Ltd.: *See—*
Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, 4,567,392, Cl. 310-313.00A.
Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, 4,567,393, Cl. 310-313.00A.
Chaki, Takao, 4,566,344, Cl. 74-10.330.

Clark, Robin D.: *See—*
Kluge, Arthur F.; Clark, Robin D.; Strosberg, Arthur M.; Pascal, Jean-Claude G.; and Whiting, Roger, 4,567,264, Cl. 544-400.000.

Clarke, Robert A., to Autodynamics Corporation of America. Wheelchair dockage and storage system. 4,566,842, Cl. 414-462.000.

Clements, Thomas: *See—*
Fallon, Merton R.; and Clements, Thomas, 4,566,476, Cl. 137-71.000.

Cleveland, William C., Jr.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,566,432, Cl. 126-438.000.

Clinton Industries, Inc.: *See—*
Tummino, John, 4,566,395, Cl. 112-292.000.

Clostermeyer, Gerhard; and Muller, Werner, to Claas Ohg. Round baling press for agricultural products. 4,566,380, Cl. 100-89.000.

Co Pharma Corporation s.r.l.: *See—*
Ferraris, Paolo C., 4,567,182, Cl. 514-262.000.

Coca-Cola Company, The: *See—*
Kroeplien, Udo; and Rosdorfer, Joachim, 4,567,194, Cl. 514-400.000.

Cofpa: *See—*
Gauthier, Maurice, 4,567,077, Cl. 428-114.000.

Cogan, Adrian I.: *See*—
Bencuya, Izak; and Cogan, Adrian I., 4,566,172, Cl. 29-571.000.
Cogliano, Joseph A., to W. R. Grace & Co. Asphalt foam. 4,567,095, Cl. 428-314.400.
Cognet, Louis; Argoud, Christian; Matray, Francois; and Mallevialle, Joel, to Societe Lyonnaise des Eaux et de l'Enclairage. Apparatus for liquid-liquid extraction using a mixing/settling process. 4,567,020, Cl. 422-101.000.
Cohen, Mitchell S.: *See*—
Afzali-Ardakani, Ali; Cohen, Mitchell S.; Pennington, Keith S.; and Sachdev, Krishna G., 4,567,490, Cl. 346-135.100.
Cohen, Paul; and Young, William R, to Harris Corporation. Cache memory flush scheme. 4,567,578, Cl. 365-189.000.
Cohen, Serge; and Nguyen, Gilbert H. K., to Framatome & Cie. Method of inspecting the operation of a valve and mechanical test bench for performing the method. 4,566,310, Cl. 73-9.000.
Coli, Giuseppe; and Rattin, Luciano, to Ing. C. Olivetti & C., S.p.A. Reproducing machine having a removable process unit. 4,566,779, Cl. 355-3.00R.
Collingwood, John C., to British Gas Corporation. Wheel probe. 4,566,332, Cl. 73-639.000.
Collins, John H.: *See*—
Baldry, Peter J.; Collins, John H.; Morantz, Daniel J.; Overton, Terence K. W.; and Wright, David W., 4,567,122, Cl. 430-4.000.
Collins, Michael J.; and Goetchius, Ronald J., to CEM Corporation. Apparatus and process for automatically determining fat contents of foods. 4,566,312, Cl. 73-32.00A.
Collins, Michael J.; and Hargett, Wyatt P., Jr., to CEM Corporation. Apparatuses, processes and articles for controllably heating and drying materials by microwave radiation. 4,566,804, Cl. 374-14.000.
Combustion Engineering, Inc.: *See*—
Borio, Donald C.; Borio, Richard W.; Hale, Gilbert L.; Mehta, Arun K.; and Tyler, Arnold L., 4,566,394, Cl. 110-347.000.
Deve, Vagn, 4,566,637, Cl. 241-23.000.
Radcliff, Frank T., 4,567,012, Cl. 376-245.000.
Riley, Brian, 4,567,031, Cl. 423-593.000.
Comeau, Roger J.; and Baran, Walter J., Jr., to United Technologies Corporation. First stage turbine vane support structure. 4,566,851, Cl. 415-139.000.
Comerford, Matthias, to Hollis Automation, Inc. Mass wave soldering system. 4,566,624, Cl. 228-180.100.
Commissariat a l'Energie Atomique: *See*—
Al Mouhamed, Mayez; Csakvary, Etienne; De Cosnac, Bertrand; and Noel, Jean-Paul, 4,566,845, Cl. 414-735.000.
Bachet, Bernard; Daguet, Jean; and Dujardin, Louis, 4,567,345, Cl. 219-121.0PT.
Dubost, Rene ; Fiori, Robert; and Seyfried, Philippe, 4,566,361, Cl. 83-454.000.
Minier, Jean; Barthelemy, Herve ; and Foglia, Vincent, 4,566,824, Cl. 405-202.000.
Compagnie Francaise des Petroles: *See*—
Moussy, Jacques L.; and Lescoeur, Jean A., 4,566,541, Cl. 166-318.000.
Compton, Arthur M. Chair for work environment. 4,566,733, Cl. 297-284.000.
Compton, William H.; and Likozar, Joseph M., to Comptrol Incorporated. Force transducer. 4,566,340, Cl. 73-862.480.
Comptrol Incorporated: *See*—
Compton, William H.; and Likozar, Joseph M., 4,566,340, Cl. 73-862.480.
Computer Products, Inc.: *See*—
Ehrlich, Stephen J.; and Nelson, Edward I., 4,567,317, Cl. 174-35.0MS.
Concast, Incorporated: *See*—
Fastert, Herbert; and Langner, Carl, 4,566,526, Cl. 164-478.000.
Connell, Ralph M.; and Dawson, Edward O. Wood-waste burner system. 4,566,393, Cl. 110-261.000.
Connelly, Robert L., to Duracell Inc. Cell vent. 4,567,118, Cl. 429-53.000.
Connolly, Walter L.: *See*—
Chow, Peter C. M.; and Connolly, Walter L., 4,566,488, Cl. 137-613.000.
Continental Can Company, Inc.: *See*—
Martin, Ralph E.; and Puidak, Heino, 4,567,410, Cl. 318-332.000.
Continental Conveyor & Equipment Co., Inc., The: *See*—
Robertson, Tommie E., 4,566,586, Cl. 198-628.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Kuhn, Heinz, 4,566,515, Cl. 152-402.000.
Mauk, Gerhard; and Huinink, Heinrich, 4,566,514, Cl. 152-209.00R.
Continental Plastic Containers, Inc.: *See*—
Szajna, John L., 4,566,509, Cl. 141-381.000.
Cook, Gary R.: *See*—
Pickett, Teddy L.; and Cook, Gary R., 4,567,100, Cl. 428-339.000.
Cooley, Jack S., to Mead Corporation, The. Packaging apparatus and method. 4,566,248, Cl. 53-48.000.
Cooper Industries, Inc.: *See*—
Maros, Ronald R., 4,566,745, Cl. 339-14.00P.
Copeland, Kenneth G.: *See*—
Winrow, Donald; and Copeland, Kenneth G., 4,566,210, Cl. 40-449.000.
Corbett, John F.: *See*—
Brown, Keith C.; and Corbett, John F., 4,566,876, Cl. 8-411.000.
Cordis Corporation: *See*—
DeHaan, Abel, 4,566,467, Cl. 128-784.000.
Koning, Gerrit; and Schroeppel, Edward A., 4,566,456, Cl. 128-419.0PG.
Core Laboratories, Inc.: *See*—
Barnaby, Harold T., 4,566,311, Cl. 73-19.000.
Corey, Philip D.; and Atkins, Elise T., to Burroughs Corporation. Parallel current sharing system. 4,567,379, Cl. 307-270.000.
Cormier, Laurent L. Smoke detector switch indicator. 4,567,477, Cl. 340-644.000.
Corning Glass Works: *See*—
Covington, Arthur K.; and Sibbald, Alastair, 4,567,006, Cl. 264-22.000.
Correnti, Albert D.; and Potechin, James, to AT&T Technologies, Inc. Method and apparatus for handling semiconductor wafers. 4,566,726, Cl. 294-64.300.
Cosentino, Charles F.: *See*—
Knoblauch, Karl; Harder, Burkhard; Heimbach, Heinrich; and Cosentino, Charles F., 4,566,282, Cl. 62-48.000.
Cossin, George E. Fish line knot tying jig. 4,566,213, Cl. 43-1.000.
Costabile, Arvid B.: *See*—
Costabile, John J.; Costabile, Arvid B.; and Costabile, Ernest, 4,566,855, Cl. 416-134.00R.
Costabile, Ernest: *See*—
Costabile, John J.; Costabile, Arvid B.; and Costabile, Ernest, 4,566,855, Cl. 416-134.00R.
Costabile, John J.; Costabile, Arvid B.; and Costabile, Ernest. Shock absorbing clutch assembly for marine propeller. 4,566,855, Cl. 416-134.00R.
Costain Petrocarbon Limited: *See*—
Openshaw, Ronald D., 4,566,887, Cl. 62-21.000.
Coulter Systems Corporation: *See*—
Kuehnle, Manfred R., 4,566,781, Cl. 355-10.000.
Coupland, Keith: *See*—
Habeeb, Jacob J.; and Coupland, Keith, 4,566,982, Cl. 252-33.600.
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, to Pierre Fabre S.A. 1-Aryl 2-aminomethyl cyclopropane carboxylates (Z). 4,567,288, Cl. 560-37.000.
Covington, Arthur K.; and Sibbald, Alastair, to Corning Glass Works. Method for encapsulating microelectronic sensor devices. 4,567,006, Cl. 264-22.000.
Cowan, Ben. Liquid piston compression systems for compressing steam. 4,566,860, Cl. 417-102.000.
Cragoe, Edward J., Jr.: *See*—
Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., 4,567,289, Cl. 560-059.000.
Cramer, Clarence W.; and Brewin, Alfred R., III, to Campbell Soup Company. System for dispensing flowable food materials. 4,566,506, Cl. 141-160.000.
Crane & Co., Inc.: *See*—
Klein, Max, 4,566,969, Cl. 210-387.000.
Crankshaw, Michael; and Allen, George A., to Label-Aire Inc. Label applicator for multiple panel wrapping. 4,566,933, Cl. 156-444.000.
Creaser, Charles W., Jr., to Chu Associates, Inc. Vibration-tolerant whip antenna. 4,567,487, Cl. 343-900.000.
Creative Products Resource Associates, Ltd.: *See*—
Smith, James A., 4,566,980, Cl. 252-8.600.
Cronan, Ronald E.: *See*—
Link, Julian V., Jr.; and Cronan, Ronald E., 4,566,558, Cl. 181-210.000.
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, to AT&T Technologies Inc.; and AT&T Bell Laboratories, a part interest. Controller for a coin telephone set. 4,567,325, Cl. 179-6.30R.
Crowley, Patrick J., to Imperial Chemical Industries PLC. Halobenzyl esters. 4,567,199, Cl. 514-531.000.
Csakvary, Etienne: *See*—
Al Mouhamed, Mayez; Csakvary, Etienne; De Cosnac, Bertrand; and Noel, Jean-Paul, 4,566,845, Cl. 414-735.000.
Csapo, Janos I.: *See*—
Smith, Louis W.; and Csapo, Janos I., 4,567,324, Cl. 179-27.0FH.
Cucuzza, Joseph R., to Richards Aerospace Research Corporation. Flying apparatus and method. 4,566,699, Cl. 244-12.200.
Cudennec, Claude: *See*—
Lavielle, Gilbert; and Cudennec, Claude, 4,567,169, Cl. 514-089.000.
Curths, Gary: *See*—
Van der Loon, Dwain; and Curths, Gary, 4,566,349, Cl. 74-475.000.
Curtin, Leonard E., to Harris Corporation. Interface for connecting standard telephones to party lines. 4,567,330, Cl. 179-17.00E.
Custom-Bilt Machinery, Inc.: *See*—
Faltin, Hans G., 4,566,687, Cl. 271-202.000.
Czabaffy, Andras: *See*—
Kaffka, Karoly; Nadai, Bela; Czabaffy, Andras; and Horvath, Lorand, 4,566,797, Cl. 356-402.000.
Czumak, Frank M.; and Wright, Joseph H., to Polaroid Corporation. Mount for transparency film frame. 4,566,770, Cl. 354-276.000.
D. L. Auld Company, The: *See*—
Waugh, Robert E., 4,566,929, Cl. 156-242.000.
Daguet, Jean: *See*—
Bachet, Bernard; Daguet, Jean; and Dujardin, Louis, 4,567,345, Cl. 219-121.0PT.
Dahlin, Robert D., to Benchcraft, Inc. Plank grating assembly. 4,566,243, Cl. 52-584.000.
Dahlstrom, D. Richard: *See*—
Gustafson, John A.; and Dahlstrom, D. Richard, 4,566,211, Cl. 40-605.000.
Dahlstrom Display, Inc.: *See*—
Gustafson, John A.; and Dahlstrom, D. Richard, 4,566,211, Cl. 40-605.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Nishibori, Setsuo; Komori, Hirohito; Saeki, Syuji; and Kinoshita, Hiromitsu, 4,567,242, Cl. 525-534.000.
Sano, Takashi; Kawabata, Kazuo; and Miya, Yoji, 4,567,106, Cl. 428-413.000.
Daicel Chemical Industries, Ltd.: *See—*
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.
Daikin Kogyo Co., Ltd.: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,566,755, Cl. 350-96.340.
Daimler-Benz Aktiengesellschaft: *See—*
Maly, Rudolf, 4,566,413, Cl. 123-256.000.
Stolz, Albert, 4,566,531, Cl. 165-42.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Matsumoto, Katsutoshi, 4,566,384, Cl. 101-170.000.
Dana Corporation: *See—*
Flotow, Richard A.; and Tennant, William M., 4,566,572, Cl. 192-70.120.
Lane, Wendell C., Jr., 4,566,573, Cl. 192-70.180.
Yant, Kenneth B., 4,566,568, Cl. 192-53.00F.
Dana, David E.: *See—*
Gaa, Peter C.; and Dana, David E., 4,567,228, Cl. 524-588.000.
Danfoss A/S: *See—*
Petersen, Hans C.; and Kyster, Erik, 4,566,272, Cl. 60-384.000.
Danieli & C. Officine Meccaniche S.p.A.: *See—*
Gigante, Sergio, 4,566,833, Cl. 414-30.000.
Danish, Sherif; and Aiken, Hugh H., to Polytel Corp. Matrix keyboard. 4,567,469, Cl. 340-365.00S.
Data Motion, Inc.: *See—*
Seitz, Alan F.; and Seitz, Karl G., 4,566,618, Cl. 226-74.000.
Dattilo, Donald P. Battery disconnect sensing circuit for battery charging systems. 4,567,421, Cl. 320-30.000.
Dautel, Heinz: *See—*
Schulze, Werner; Gerich, Josef; Scheef, Emil; and Dautel, Heinz, 4,566,723, Cl. 285-86.000.
Dautremont, Jean: *See—*
Bizot, Henri; Dautremont, Jean; and Sylvian, Alain, 4,566,225, Cl. 51-165.720.
David, Lawrence D.; and Arons, Richard M., to Celanese Corporation. Ferrimagnetic spinel fibers. 4,567,101, Cl. 428-364.000.
Davidson, Marion A.; and Kiss, David B., to Southern Systems, Inc. Chain pull monitor system. 4,566,339, Cl. 73-862.390.
Davis, Eugene E., to Johnsen & Jorgensen (Plastics) Limited. Tamper-resistant closure. 4,566,602, Cl. 215-256.000.
Davison, Charles F., to Norwood Marking & Equipment Co., Inc. Hot ink imprinter with swinging print head. 4,566,386, Cl. 101-305.000.
Davy Mckee (London) Limited: *See—*
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,567,306, Cl. 568-455.000.
Dawson, Edward O.: *See—*
Connell, Ralph M.; and Dawson, Edward O., 4,566,393, Cl. 110-261.000.
Day, Clive R.: *See—*
Beales, Keith J.; Day, Clive R.; Ainalie, Benjamin J.; and Rush, James D., 4,566,754, Cl. 350-96.300.
Daya, Shiraz: *See—*
Pompei, Francesco; and Daya, Shiraz, 4,566,808, Cl. 374-124.000.
de la Guardia, Mario; and Kao, Ming-Luh, to Racal Data Communications Inc. Processor controlled digital video sync generation. 4,567,521, Cl. 358-150.000.
Dearborn Chemicals, Ltd.: *See—*
Bennison, John J.; Longworth, Stuart W.; and Baker, John G., 4,566,972, Cl. 210-698.000.
Deaton, Thomas M., to Otis Engineering Corporation. Well safety and kill valve. 4,566,478, Cl. 137-112.000.
DeBondt, Dick. Method and device for controlling the curing rate of concrete. 4,566,806, Cl. 374-53.000.
de Castiglione, Roberto ; Perseo, Giuseppe; Gigli, Mauro; and Hecht, Barbara, to Farmitalia Carlo Erba. Biologically active heptapeptides. 4,567,162, Cl. 514-16.000.
Decoene, Frans J. G. C.; and Vansteelant, Marc G., to Sperry Corporation. Round baler with vertically elongated starting chamber. 4,566,379, Cl. 100-89.000.
De Cosnac, Bertrand: *See—*
Al Mouhamed, Mayez; Csakvary, Etienne; De Cosnac, Bertrand; and Noel, Jean-Paul, 4,566,845, Cl. 414-735.000.
Degenne, Michel, to Isover Saint-Gobain. Sensor of energy flux, in particular heat flux and visible and infrared radiation. 4,567,365, Cl. 250-338.000.
DeGroot, Alice A. Training halter for canines. 4,566,255, Cl. 54-24.000.
Deguchi, Takahiko: *See—*
Miyagi, Masahiro; Uehara, Katsuharu; Nozawa, Yoshio; and Deguchi, Takahiko, 4,566,359, Cl. 83-23.000.
DeHaan, Abel, to Cordis Corporation. Electrical connection between coiled lead conductor and lead tip electrode. 4,566,467, Cl. 128-784.000.
Deinega, Jury F.: *See—*
Vinogradov, Georgy V.; Deinega, Jury F.; Yanovsky, Jury G.; Vasilieva, Olga V.; Konstantinov, Alexandr A.; and Chernysh, Mikhail M., 4,566,324, Cl. 73-60.000.
Deis, Bert C., to United States of America, National Aeronautics and Space Administration. Drop foot corrective device. 4,566,447, Cl. 128-80.00E.
de Jonge, Cornelis A. M.: *See—*
Groen, Robertus W. C.; de Jonge, Cornelis A. M.; Schwartz, Lawrence M.; and van Lier, Johannes C., 4,567,534, Cl. 358-342.000.
Delevallee , Francoise ; Deraedt, Roger; and Le Martret, Odile, to Roussel Uclaf. Ethanethioates and mercaptoamides and use thereof as analgesic and enkephalinase inhibitory compounds. 4,567,198, Cl. 514-513.000.
Demark, Anthony M.: *See—*
Bozarth, Theodore B.; Demark, Anthony M.; Finn, Edward F.; and Lynch, Frank, 4,567,466, Cl. 340-347.0AD.
Demizu, Akira, to Mitsubishi Denki Kabushiki Kaisha. Diesel engine glow plug controlling device. 4,566,410, Cl. 123-179.0BG.
DeMur, Cynthia L.: *See—*
Friedman, Harvey W.; Kohli, Jerry L.; and DeMur, Cynthia L., 4,566,721, Cl. 281-31.000.
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., to Davy Mckee (London) Limited. Continuous process for the production of aldehydes by hydroformylation of olefins. 4,567,306, Cl. 568-455.000.
Deodhar, Shirish P., to Burroughs Corporation. Reed-Solomon error detecting and correcting system employing pipelined processors. 4,567,594, Cl. 371-38.000.
Deraedt, Roger: *See—*
Delevallee , Francoise ; Deraedt, Roger; and Le Martret, Odile, 4,567,198, Cl. 514-513.000.
de Reinach Hirtzbach, Francois: *See—*
Ambrosi, Dominique; and de Reinach Hirtzbach, Francois, 4,566,899, Cl. 71-93.000.
DeRome, Gerard A.: *See—*
Carrasco, Francis P.; DeRome, Gerard A.; and Fernekes, David W., 4,567,328, Cl. 179-2.00A.
Derus, Patricia M.: *See—*
Berner, John M.; Derus, Patricia M.; and Berner, James P., 4,566,440, Cl. 128-25.00R.
DeSantis, Richard W., to Victory Lane Ltd. Liniment composition. 4,567,044, Cl. 424-94.000.
Design & Manufacturing Corporation: *See—*
Keal, Charles, Jr., 4,567,067, Cl. 427-328.000.
Detournay, Jacquy J. C.; and Sterckx, Jozef V. M., to Metallurgie Hoboken-Overpelt. Process for defluorinating an acid sulphate solution. 4,567,027, Cl. 423-101.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Wiegand, Herbert, 4,566,634, Cl. 239-410.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Popp, Franz-Wolfgang; and Feuring, Kurt, 4,567,014, Cl. 376-272.000.
Deve, Vagn, to Combustion Engineering, Inc. Thermal sand reclamation system. 4,566,637, Cl. 241-23.000.
DeVires, Louis; and Ryason, P. R., to Chevron Research Company. Conversions of low molecular weight hydrocarbons to higher molecular weight hydrocarbons using a silicon compound-containing catalyst. 4,567,311, Cl. 585-415.000.
De Witt, Nick; and Greene, Lindsey C., to X-Ten Corporation. Universal chassis for hauling containers. 4,566,714, Cl. 280-404.000.
deWitt, Paolo: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and deWitt, Paolo, 4,567,200, Cl. 514-547.000.
Dharia, Dilip: *See—*
Patel, Pinakin; Dharia, Dilip; and Maru, Hansraj, 4,567,117, Cl. 429-19.000.
Diaz, Henri; Jorgensen, Pierre; and Vernet, Pierre, to British Petroleum Company p.l.c., The. Electric arc conversion process. 4,566,961, Cl. 204-168.000.
Dick, Richard J.: *See—*
McGinniss, Vincent D.; and Dick, Richard J., 4,566,906, Cl. 106-15.050.
Dickenson, Donald E.: *See—*
Zimmerman, Garyx; and Dickenson, Donald E., 4,567,054, Cl. 426-548.000.
Dickinson, Lawrence C. Adjustable insert support. 4,566,826, Cl. 407-37.000.
Didier-Werke AG: *See—*
Schnabel, Jurgen; and Plath, Jurgen, 4,566,925, Cl. 156-86.000.
DiGiovanniantonio, Perry R.; and Zimmer, William J., to United States of America, Navy. Aircraft barricade. 4,566,658, Cl. 244-110.00R.
DiGiuseppe, Michael A.: *See—*
Brasen, Daniel; DiGiuseppe, Michael A.; Lourenco, Jose A.; and Mahajan, Subhash, 4,566,934, Cl. 156-622.000.
DiNozzi, Robert D.: *See—*
Sleger, Leon F.; and DiNozzi, Robert D., 4,566,594, Cl. 209-539.000.
Discovision Associates: *See—*
Tabata, George K., 4,567,531, Cl. 358-335.000.
Disko, Harry: *See—*
Kulesza, Ralph J.; Wozniak, Walter J.; Disko, Harry; and Meyer, Burton C., 4,566,195, Cl. 33-27.110.
Display Components, Inc.: *See—*
Sawyer, Carleton E.; and Masterman, Hugh C., 4,566,179, Cl. 29-596.000.
Ditcher, Jack, to A-Lok Products, Inc. Drop manhole precast encasement. 4,566,483, Cl. 137-372.000.
Dobbelstein, Arnold: *See—*
Ott, Gunther; Dobbelstein, Arnold; Geist, Michael; Schon, Georg; and Ahlers, Klaas, 4,566,963, Cl. 204-181.700.

Dobsa, Josip; and Hammad, Adel, to BBC Brown, Boveri & Company, Limited. Phase shifting transformer arrangement for damping subsynchronous oscillations. 4,567,423, Cl. 322-58.000.

Dobsa, Josip; Mauchle, Peter; Pfyl, Walter; and Sadek, Kadry, to BBC Brown, Boveri & Company, Limited. Reactive power compensator with capacitor and capacitor discharge circuit. 4,567,424, Cl. 323-210.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Peter, Dietmar, 4,566,407, Cl. 123-41.480.

Dr. Karl Thomae GmbH: *See*—
Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,567,178, Cl. 514-215.000.

Dodge, William B., to Olin Corporation. Process and apparatus for producing cyanuric acid. 4,567,258, Cl. 544-192.000.

Dohren, Hans: *See*—
Seipenbusch, Jurgen; and Dohren, Hans, 4,566,880, Cl. 48-73.000.

Dolan, Donald T., to Pitney Bowes Inc. Method of producing a light emiting diode array. 4,566,170, Cl. 29-569.00L.

Doliner, Herbert: *See*—
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.

Dolsen, Philip C.; Chandra, Satish; Hammon, Gordon R.; and Uren, William J., to Babcock & Wilcox Company, The. Bypass control for stations in a communication system. 4,567,482, Cl. 340-825.050.

Dombro, Robert A.: *See*—
Pullukat, Thomas J.; Hwang, Yu-Tang; and Dombro, Robert A., 4,567,243, Cl. 526-128.000.

Dombroski, Robert M.: *See*—
Elliott, Kirk W.; Garver, Christian J.; Kayser, John P.; and Dombroski, Robert M., 4,566,560, Cl. 184-15.100.

Donald, Jimmie W. Rotatable mounting unit. 4,566,664, Cl. 248-349.000.

Donaldson, Dwight L.: *See*—
Ostergaard, James R., II; and Donaldson, Dwight L., 4,566,732, Cl. 297-174.000.

Donelson, Richard K., to Allis-Chalmers Corporation. Method for manufacturing a stay ring bearing stationary guide vanes for a non-gated turbine. 4,566,166, Cl. 29-156.80R.

Donetsky Nauchno-Issledovatelsky Ugolny Institut: *See*—
Gorlov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., 4,566,587, Cl. 198-732.000.

Dover Corporation: *See*—
Atkey, Richard E., 4,566,561, Cl. 187-20.000.

Dow Chemical Company, The: *See*—
Cipriano, Robert A., 4,566,956, Cl. 204-72.000.
Dubois, Robert A., 4,567,281, Cl. 549-288.000.
Fung, Alexander P., 4,567,273, Cl. 546-345.000.
Gatlin, Janice E.; Van Dort, Mark A.; Wilson, Charles A.; and Fung, Alexander P., 4,567,274, Cl. 546-345.000.
Kitchens, John D.; and Novak, Leo R., 4,567,241, Cl. 525-352.000.
Koolen, Johannes L. A., 4,566,807, Cl. 374-112.000.
Lam, Chiu T.; and Shannon, David M., 4,567,157, Cl. 502-208.000.
Park, Chung P., 4,567,209, Cl. 521-81.000.
Van Gilder, Ron L.; and Lee, Do I., 4,567,099, Cl. 428-327.000.
Woo, Edmund P., 4,567,005, Cl. 260-465.00D.

Dow Corning Corporation: *See*—
Bauman, Therese M.; and Lee, Chi-Long, 4,567,212, Cl. 521-122.000.
Huebner, David J.; and Saam, John C., 4,567,231, Cl. 524-837.000.

Doyle, Terrence W.: *See*—
Vyas, Dolatrai M.; Kaneko, Takushi; and Doyle, Terrence W., 4,567,256, Cl. 544-58.200.

Draft Systems, Inc.: *See*—
Fallon, Merton R.; and Clements, Thomas, 4,566,476, Cl. 137-71.000.

Draper, Reed T.; and Pol, Kenneth J., to Draper Technologies, Inc. System for converting stack access newspaper vending machines and the like to apparatus for dispensing products one at a time. 4,566,608, Cl. 221-229.000.

Draper Technologies, Inc.: *See*—
Draper, Reed T.; and Pol, Kenneth J., 4,566,608, Cl. 221-229.000.
Martin, Dennis R., 4,566,581, Cl. 194-248.000.

Drechsler, Herbert: *See*—
Turtschan, Alfons; and Drechsler, Herbert, 4,566,591, Cl. 206-427.000.

Dreher, Ulrich; and Reitz, Helmut, to Institut Dr. Friedrich Forster. Self-centering driver for oblong material. 4,566,585, Cl. 198-624.000.

Dressel, Manfred; Eberle, Heinrich; Ripperger, Willi; Ruehenbeck, Wolfgang; and Zwick, Werner, to BASF Aktiengesellschaft. Preparation of ammonium carbamate. 4,567,294, Cl. 562-555.000.

Dresser Industries, Inc.: *See*—
Kidd, Harry A.; and Edwards, Thomas R., 4,566,266, Cl. 60-39.060.

Driessen, Leonardus M. H. E., to U.S. Philips Corporation. System for decoding and displaying encoded television pictures. 4,567,518, Cl. 358-133.000.

Duane, Michael P.: *See*—
Smayling, Michael C.; and Duane, Michael P., 4,566,175, Cl. 29-576.00B.

DuBois, Chester G.: *See*—
Billingsley, Henry C.; and DuBois, Chester G., 4,566,424, Cl. 123-583.000.

Dubois, Robert A., to Dow Chemical Company, The. Preparation of lactone-fused aromatic compounds. 4,567,281, Cl. 549-288.000.

Dubost, Rene ; Fiori, Robert; and Seyfried, Philippe, to Commissariat a l'Energie Atomique. Apparatus for shearing irradiated fuel assemblies. 4,566,361, Cl. 83-454.000.

Ducanis, Paul. Bar stock guide arrangement for screw machines. 4,566,358, Cl. 82-38.00A.

Ductmate Industries, Inc.: *See*—
Arnoldt, Peter J.; and Greiner, Waldemar H., 4,566,724, Cl. 285-364.000.

Dufft, Jurgen, to Lucas Industries Limited. Method of producing a metal tube and flange assembly. 4,566,623, Cl. 228-138.000.

Duguet, Jean, to L'Etat Francais represente par le Delegue Ministeriel pour L'Armement. Priming composition which is sensitive to percussion and a method for preparing it. 4,566,921, Cl. 149-22.000.

Dujardin, Louis: *See*—
Bachet, Bernard; Daguet, Jean; and Dujardin, Louis, 4,567,345, Cl. 219-121.0PT.

Dumbri, Austin C.; and Procyk, Frank J., to AT&T Bell Laboratories. Column decoder circuit for use with memory using multiplexed row and column address lines. 4,567,581, Cl. 365-230.000.

Dunsworth, Charles L., to Metalines, Inc. Smoke and heat barrier. 4,566,242, Cl. 52-573.000.

Duphar International Research B.V.: *See*—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,567,295, Cl. 564-44.000.

Duplo Manufacturing Corporation: *See*—
Matsushita, Ken; and Onishi, Tetsuo, 4,566,383, Cl. 101-121.000.

Duplo Seiko Corporation: *See*—
Matsushita, Ken; and Onishi, Tetsuo, 4,566,383, Cl. 101-121.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bennett, Allyn N., 4,567,128, Cl. 430-313.000.
Fan, Roxy N., 4,567,062, Cl. 427-96.000.
Held, Robert P., 4,567,129, Cl. 430-294.000.
Held, Robert P., 4,567,130, Cl. 430-294.000.
Reap, James J., 4,566,898, Cl. 71-93.000.
Resnick, Paul R., 4,567,003, Cl. 260-458.00F.
Taylor, Barry E., 4,567,151, Cl. 501-15.000.

Duracell Inc.: *See*—
Connelly, Robert L., 4,567,118, Cl. 429-53.000.

Durand, Marc, to Chavanoz S.A. Method and apparatus for the manufacture of fancy yarns. 4,566,259, Cl. 57-6.000.

Durr, Manfred; Gajdos, Benedikt; Gneuss, Klaus-Dieter; Harhausen, Ekkehard; and Seidel, Jurgen, to A. Nattermann & Cie GmbH. Pharmaceutical amitriptylin oxide preparation and process for its manufacture. 4,567,202, Cl. 514-656.000.

Durst, Tony; Glinski-Oomen, Margaret B.; and Freed, James C. 2-Substituted derivatives of podophyllotoxin and etoposide. 4,567,253, Cl. 536-18.100.

E. R. Squibb & Sons, Inc.: *See*—
Charles, Isabel; and Robinson, Malcolm, 4,567,034, Cl. 424-5.000.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,567,166, Cl. 514-82.000.
Karanewsky, Donald S., 4,567,167, Cl. 514-89.000.

E. Ruter GmbH: *See*—
Ruter, Ewald, 4,566,245, Cl. 52-645.000.

Eastern Company, The: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,566,167, Cl. 29-437.000.

Eastman Kodak Company: *See*—
Ames, William A., 4,567,223, Cl. 524-489.000.
Haas, Daniel D., 4,566,798, Cl. 356-448.000.
Henry, James W.; and Mumpower, Robert C., 4,567,372, Cl. 250-560.000.

Eaton Corporation: *See*—
Amlani, Kish; and Gindy, Sherif, 4,567,377, Cl. 307-112.000.
Kenny, Andrew A.; Sokalski, Robert G.; Egle, Lawrence E.; and Stahly, Daniel C., 4,566,423, Cl. 123-571.000.

Eatwell, William D.: *See*—
Pringle, Ronald E.; and Eatwell, William D., 4,566,540, Cl. 166-317.000.

Eberl, Lernhard: *See*—
Bauer, Otto; Eberl, Lernhard; Geyer, Gerhard; and Straubel, Max, 4,566,421, Cl. 123-502.000.

Eberle, Heinrich: *See*—
Dressel, Manfred; Eberle, Heinrich; Ripperger, Willi; Ruehenbeck, Wolfgang; and Zwick, Werner, 4,567,294, Cl. 562-555.000.

Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, to Dr. Karl Thomae GmbH. Substituted 5,11-dihydro-6H-dibenz[b,e]azepin-6-ones and pharmaceutical compositions containing same. 4,567,178, Cl. 514-215.000.

Ebey, Edward; and Richter, Karl E., to Fulton Manufacturing Corporation. Neutral winch. 4,566,674, Cl. 254-345.000.

Echols, Sylvia S. Nursing blouse with hidden opening. 4,566,136, Cl. 2-104.000.

Echte, Adolf; Gausepohl, Hermann; Hambrecht, Juergen; and Gerberding, Karl, to BASF Aktiengesellschaft. Continuous preparation of rubber-modified polymers of vinyl-aromatics. 4,567,232, Cl. 525-53.000.

Ecklin, John W. Biased unitized motor alternator with stationary armature and field. 4,567,407, Cl. 318-140.000.

Edwards, Bobby: *See*—
Acree, William M.; Edwards, Bobby; and Black, John W., 4,567,042, Cl. 424-89.000.
Acree, William M.; Edwards, Bobby; and Black, John W., 4,567,043, Cl. 424-89.000.

Edwards, Floyd V.; and Boehmer, Dennis A., to Vernay Laboratories, Inc. Valve assembly. 4,566,493, Cl. 137-846.000.

Edwards, James W.: *See—*
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,567,158, Cl. 502-209.000.

Edwards, Philip N.; and Large, Michael S., to Imperial Chemical Industries PLC. Bis(1-substituted biguanide) derivatives. 4,567,174, Cl. 514-210.000.

Edwards, Thomas R.: *See—*
Kidd, Harry A.; and Edwards, Thomas R., 4,566,266, Cl. 60-39.060.

Egan, Paul F.; Broadfoot, William D.; and Alden, Peter. Catseye mountings. 4,566,820, Cl. 404-14.000.

Egerbacher, Werner; and Wunderlich, Dieter, to Siemens Aktiengesellschaft. Semiconductor component with a disc-shaped case. 4,567,504, Cl. 357-79.000.

Egle, Lawrence E.: *See—*
Kenny, Andrew A.; Sokalski, Robert G.; Egle, Lawrence E.; and Stahly, Daniel C., 4,566,423, Cl. 123-571.000.

Ehara, Kohei: *See—*
Itsumi, Manabu; Ehara, Kohei; Muramoto, Susumu; and Matsuo, Seitaro, 4,566,940, Cl. 156-643.000.

Ehm, Karl H.; and Orendi, Roderich R., to Tremag Trennmaschinen-Gesellschaft mbH. Method of clamping tube-like members and apparatus for carrying out the method. 4,566,679, Cl. 269-23.000.

Ehrat, Kurt. Magnetic game. 4,566,694, Cl. 273-1.0GB.

Ehrlich, Stephen J.; and Nelson, Edward I., to Computer Products, Inc. EMI/RFI Protected enclosure. 4,567,317, Cl. 174-35.0MS.

Eicken, Karl; Scheib, Klaus; Theobald, Hans; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, to BASF Aktiengesellschaft. 7-Aminoazolo[1,5-a]-pyrimidines and fungicides containing these compounds. 4,567,263, Cl. 544-263.000.

Eimer, Klaus: *See—*
Bochinski, Rolf; Eimer, Klaus; Littek, Harald; and Nasse, Johannes, 4,566,533, Cl. 165-95.000.

Eiringhaus, Wilhelm: *See—*
Altwicker, Gerd; and Eiringhaus, Wilhelm, 4,566,182, Cl. 29-715.000.

Eisai Co., Ltd.: *See—*
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.

Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, to Neste Oy. Method of producing cellulose carbamate. 4,567,255, Cl. 536-30.000.

Ekman, Kurt: *See—*
Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, 4,567,255, Cl. 536-30.000.

Electro-Nite Co.: *See—*
Theuwis, Alfons L.; and Maes, Joseph M., 4,566,343, Cl. 73-864.590.

Electro-Nucleonics, Inc.: *See—*
Mandle, Richard M., 4,566,790, Cl. 356-246.000.

Electro-Voice, Incorporated: *See—*
Watson, Alan R.; and Overley, John P., 4,567,608, Cl. 381-122.000.

Electronic Flo-Meters, Inc.: *See—*
Boykin, John C., 4,566,307, Cl. 73-3.000.

Elf France: *See—*
Hagenbach, Germain; Maldonado, Paul; and Maurice, Jacques, 4,567,222, Cl. 524-476.000.

Elhaus, Friedrich W. Profile extruder including pull measuring means. 4,566,298, Cl. 72-6.000.

Eli Lilly and Company: *See—*
Schaus, John M., 4,567,266, Cl. 546-82.000.

Elliott, Kirk W.; Garver, Christian J.; Kayser, John P.; and Dombroski, Robert M., to Madison-Kipp Corporation. Movable lubricator apparatus. 4,566,560, Cl. 184-15.100.

Embree, David M.; Goldthorp, David C.; Longenecker, Howard H.; and Vogelpohl, David R., to AT&T Technologies; and AT&T Bell Laboratories. Electronic tone ringer with distinctive signaling circuitry. 4,567,333, Cl. 179-84.00T.

Emhart Industries, Inc.: *See—*
Kulig, Constantine W.; Kingsbury, Charles M.; and Beckwith, Bruce R., 4,566,894, Cl. 65-304.000.

Emoto, Kazuhiro; and Haino, Kozo, to Mitsubishi Paper Mills, Ltd. Hydrazone photoconductive materials for electrophotography. 4,567,126, Cl. 430-59.000.

Empi, Inc.: *See—*
Berner, John M.; Derus, Patricia M.; and Berner, James P., 4,566,440, Cl. 128-25.00R.

Emrich, Ronald J.: *See—*
Arner, Russell E.; Emrich, Ronald J.; Gianelos, James; and Haynes, Marlon L., 4,566,293, Cl. 62-514.00R.

Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, to Kabushiki Kaisha Toshiba. CCD Picture element defect compensating apparatus. 4,567,525, Cl. 358-213.000.

Energy Development Associates, Inc.: *See—*
Jorne, Jacob; Roayaie, Emad; and Shah, Atul, 4,567,120, Cl. 429-72.000.

Energy Management Corporation: *See—*
Hirsch, Michael, 4,567,563, Cl. 364-420.000.

Energy Research Corporation: *See—*
Patel, Pinakin; Dharia, Dilip; and Maru, Hansraj, 4,567,117, Cl. 429-19.000.

ENFO Grundlagenforschungs AG: *See—*
Frisch, Herbert, 4,567,394, Cl. 310-330.000.

Engel, Wolfhard: *See—*
Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,567,178, Cl. 514-215.000.

Engelmann, Axel, to Hoechst Aktiengesellschaft. Process for the preparation of acid dyestuffs of low electrolyte content of the triphenylmethane series. 4,566,999, Cl. 260-392.000.

Englund, Richard L., to Index Industries, Inc. Thermostatic switch. 4,567,458, Cl. 337-365.000.

Enk, William A.; and Migis, Ronald P., to Enk, William A. Fire protection system for aircraft. 4,566,542, Cl. 169-62.000.

Enomoto, Fukumasa: *See—*
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.

Enomoto, Hiromu: *See—*
Yasuda, Yasushi; Enomoto, Hiromu; Shimauchi, Yoshiki; and Tahara, Akinori, 4,567,380, Cl. 307-290.000.

Enomoto, Masaki; and Ozawa, Michihiro, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Core construction of nuclear reactor. 4,567,018, Cl. 376-435.000.

Enthone, Incorporated: *See—*
Schultz, Paul B.; and Yarkosky, Eugene F., 4,567,066, Cl. 427-305.000.

Epson Corporation: *See—*
Ikeda, Masayuki, 4,567,448, Cl. 331-25.000.

Erasmus, Stephen J.: *See—*
Smith, Kenneth C. A.; and Erasmus, Stephen J., 4,567,369, Cl. 250-397.000.

Erbse, Dietmar: *See—*
Friesner, Karl; Bege, Dietmar; Erbse, Dietmar; and Meininger, Siegfried, 4,566,204, Cl. 34-15.000.

Ergenics, Inc.: *See—*
Sandrock, Gary D.; and Snape, Edwin, 4,566,281, Cl. 62-48.000.

Erikson, Keith W.: *See—*
Erikson, Kenneth W.; and Erikson, Keith W., 4,566,345, Cl. 74-89.150.

Erikson, Kenneth W.; and Erikson, Keith W. Tool carrier assembly. 4,566,345, Cl. 74-89.150.

Eriksson, Leif K. S., to Saab-Scania Aktiebolag. Synchronizing mechanism in a vehicle gearbox. 4,566,569, Cl. 192-53.00G.

Eriksson, Stig; Granberg, Bengt; and Westberg, Erik, to ASEA Aktiebolag. Supervisory desk. 4,566,741, Cl. 312-194.000.

Ernst, Franz: *See—*
Berger, Hermann; and Ernst, Franz, 4,567,559, Cl. 364-183.000.

Ernst, Hansgeorg; Schmidt, Wolfram; and Paust, Joachim, to BASF Aktiengesellschaft. Preparation of riboflavin. 4,567,261, Cl. 544-251.000.

Ernst Winter & Sohn (GmbH & Co): *See—*
Schleich, Heinrich; and Yegenoglu, Kemal, 4,566,426, Cl. 125-11.00R.

Ertel, Gerhard, to Schott Glaswerke. Method for forming glass to metal seals in structural members. 4,566,892, Cl. 65-59.240.

Ervin, Jacqueline L.: *See—*
Neidleman, Saul L.; and Ervin, Jacqueline L., 4,567,144, Cl. 435-134.000.

Esco Metallwaren Martin Huhnken: *See—*
Ghibely, Bruno, 4,566,622, Cl. 227-120.000.

Esmil Hubert B.V.: *See—*
van Buytene, Arie J., 4,566,377, Cl. 99-474.000.

Essex Specialty Products, Inc.: *See—*
Rizk, Sidky D.; Hsieh, Harry W. S.; and Mazzeo, Michael P., 4,567,107, Cl. 428-425.500.

Ethyl Corporation: *See—*
Pettigrew, F. Alexander; and Penton, Harold R., 4,567,229, Cl. 524-610.000.

Ethyl Molded Products Company: *See—*
Bowyer, Edward E., 4,566,508, Cl. 141-381.000.

Evans, Robert W. Single acting hydraulic fishing jar. 4,566,546, Cl. 175-297.000.

Ewald, James L.; and Rodal, Jose J. A., to Beloit Corporation. Headbox trailing element. 4,566,945, Cl. 162-343.000.

Ex-Cell-O Corporation: *See—*
Spisak, Anthony F.; Stefanovic, Sava; and Pawloski, Curtis H., 4,566,251, Cl. 53-167.000.

Exergen Corporation: *See—*
Pompei, Francesco; and Daya, Shiraz, 4,566,808, Cl. 374-124.000.

Exxon Research and Engineering Co.: *See—*
Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., 4,567,205, Cl. 518-715.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,567,156, Cl. 502-173.000.
Graves, Victoria, 4,567,153, Cl. 502-113.000.
Habeeb, Jacob J.; and Coupland, Keith, 4,566,982, Cl. 252-33.600.
Olmstead, William N., 4,566,965, Cl. 208-11.00R.
Pafford, Bernie J.; and Bertsch, Carl F., 4,566,966, Cl. 208-113.000.
Peer, Thomas R., 4,567,570, Cl. 364-900.000.
Pine, Lloyd A., 4,567,152, Cl. 502-64.000.

Fab Industries, Inc.: *See—*
Krawczyk, Simon W., 4,567,075, Cl. 428-91.000.

Faber, Marcel; Bernstein, Jerome D.; and Grossman, Matthew, to HRI, Inc. Continuous production of ethanol by use of respiration deficient mutant yeast. 4,567,145, Cl. 435-161.000.

Fabian, Rainer; Marold, Freimut; and Latzin, Dieter, to Linde Aktiengesellschaft. Process and apparatus for obtaining pure CO. 4,566,886, Cl. 62-11.000.

Fabriques de Tabac Reunies, S.A.: *See*—
Berger, Maurice; Bernasconi, Jean-Francois; and Juillerat, Michel R., 4,566,836, Cl. 414-57.000.
Facet Enterprises, Inc.: *See*—
Sekella, T. Curran, 4,566,575, Cl. 192-84.00C.
FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien: *See*—
Schmucker, Wolfgang, 4,566,262, Cl. 57-264.000.
Smuda, Siegfried; Horner, Peter; Kogel, Karl; and Zeitler, Peter, 4,566,673, Cl. 254-84.000.
Fairchild Camera & Instrument Corporation: *See*—
Koh, Yun B., 4,567,058, Cl. 427-55.000.
Varshney, Ramesh C., 4,567,580, Cl. 365-200.000.
Falater, Scott L.; and Beasom, James D., to Harris Corporation. Power switched logic gates. 4,567,385, Cl. 307-443.000.
Falcon Jet Corporation: *See*—
Alie, Enrique; Gilmore, Arthur H.; and Mack, Henry J., Jr., 4,567,547, Cl. 362-154.000.
Fallenius, Kai B.: *See*—
Kivisto, Tuomo V. J.; Fallenius, Kai B.; and Niitti, Timo U., 4,566,968, Cl. 210-221.100.
Fallon, Merton R.; and Clements, Thomas, to Draft Systems, Inc. Flow control device. 4,566,476, Cl. 137-71.000.
Falls, James J., to Baird Corporation. Authentication device. 4,567,370, Cl. 250-461.100.
Faltin, Hans G., to Custom-Bilt Machinery, Inc. Transferring newspapers or the like from a moving belt to a series of clamps. 4,566,687, Cl. 271-202.000.
Fan, Roxy N., to Du Pont de Nemours, E. I., and Company. Process for photoformed plastic multistrate using two layer film. 4,567,062, Cl. 427-96.000.
Fanuc Ltd: *See*—
Nozawa, Ryoichiro; Kinoshita, Mitsuo; and Matsumura, Teruyuki, 4,567,342, Cl. 219-69.00M.
Farmitalia Carlo Erba: *See*—
de Castiglione, Roberto ; Perseo, Giuseppe; Gigli, Mauro; and Hecht, Barbara, 4,567,162, Cl. 514-16.000.
Farr, Glyn P. R., to Lucas Industries Public Limited Company. Hydraulic boosters for vehicle braking systems. 4,566,275, Cl. 60-554.000.
Farr, James I., deceased (by Farr, May S., administrator), to American Hospital Supply Corporation. Nebulizer. 4,566,452, Cl. 128-200.210.
Farr, May S., administrator: *See*—
Farr, James I., deceased, 4,566,452, Cl. 128-200.210.
Fassbender, Charles J., to Burroughs Corporation. Controller for controlling access to a plurality of records that can be accessed and changed by several independent processors. 4,567,562, Cl. 364-200.000.
Fastert, Herbert; and Langner, Carl, to Concast, Incorporated. Method and apparatus for semi-horizontal continuous casting. 4,566,526, Cl. 164-478.000.
Fasth, Ulf K. F. Positioning apparatus. 4,566,738, Cl. 308-3.00A.
Fauran, Francois: *See*—
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,567,288, Cl. 560-37.000.
Fedele, Vincent, to Kronos Incorporated. Method of and apparatus for automatic line identification for recording on employee time cards and the like. 4,567,357, Cl. 235-377.000.
Feher, Kamilo: *See*—
Kato, Shuzo; and Feher, Kamilo, 4,567,602, Cl. 375-60.000.
Feldmann, Rainer: *See*—
Panoch, Hans J.; Feldmann, Rainer; Hinn, Hans; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,566,931, Cl. 156-330.900.
Feliz, Jack M. Stair-climbing conveyance. 4,566,551, Cl. 180-9.100.
Fellner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., to G. D. Searle & Co. Imidazole derivatives used in antithrombotic method. 4,567,189, Cl. 514-338.000.
Ferag AG: *See*—
Reist, Walter, 4,566,686, Cl. 271-201.000.
Fergg, Berthold: *See*—
Fursich, Manfred; Treiber, Helmut; Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,566,786, Cl. 355-77.000.
Fernekes, David W.: *See*—
Carrasco, Francis P.; DeRome, Gerard A.; and Fernekes, David W., 4,567,328, Cl. 179-2.00A.
Ferraris, Paolo C., to Co Pharma Corporation s.r.l. Compounds endowed with immunomodulating activity. 4,567,182, Cl. 514-262.000.
Feuring, Kurt: *See*—
Popp, Franz-Wolfgang; and Feuring, Kurt, 4,567,014, Cl. 376-272.000.
Fiberglas Canada Inc.: *See*—
Blackmore, Phillip W.; Fletcher, William T.; and Burn, Terry B., 4,567,078, Cl. 428-119.000.
Fiberite Corporation: *See*—
Levin, Jordan, 4,567,094, Cl. 428-256.000.
Fickert, Werner: *See*—
Orth, Winfried; and Fickert, Werner, 4,567,272, Cl. 546-281.000.
Fierens, Gustaaf E. M.: *See*—
Goossens, Urbanus P. M.; and Fierens, Gustaaf E. M., 4,567,327, Cl. 179-115.50R.
Filshtinsky, Michael: *See*—
Story, Arthur L.; and Filshtinsky, Michael, 4,566,545, Cl. 175-226.000.
Findeis, Gunter: *See*—
Fursich, Manfred; Treiber, Helmut; Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,566,786, Cl. 355-77.000.
Fink, Roland; and Klingenstein, Walter, to Oskar Frech GmbH and Co. Hot chamber die casting machine. 4,566,522, Cl. 164-316.000.
Finley, Richard O., to Plastiflex Company International. Lightweight current-carrying hose. 4,567,319, Cl. 174-47.000.
Finn, Edward F.: *See*—
Bozarth, Theodore B.; Demark, Anthony M.; Finn, Edward F.; and Lynch, Frank, 4,567,466, Cl. 340-347.0AD.
Fiori, Robert: *See*—
Dubost, Rene ; Fiori, Robert; and Seyfried, Philippe, 4,566,361, Cl. 83-454.000.
Firestone Tire & Rubber Company, The: *See*—
Oberster, Arthur E.; and Vicic, John C., 4,567,211, Cl. 521-98.000.
Firth, Milton D. Garden pest barrier. 4,566,219, Cl. 43-107.000.
Firth, William C., Jr., to Union Camp Corporation. Method and media for stimulating growth in foliage plants. 4,566,896, Cl. 71-24.000.
Fischer, Joachim: *See*—
Badenhop, Charles T.; and Fischer, Joachim, 4,567,009, Cl. 264-41.000.
Fisher, Curt: *See*—
Honekman, Robert D.; and Fisher, Curt, 4,567,461, Cl. 340-323.00R.
Fitzwater, Edwin, to Regina Corporation. Cam latch for cleaning devices. 4,566,149, Cl. 15-320.000.
Fives-Cail Babcock: *See*—
Georget, Jean-Pierre, 4,566,165, Cl. 29-121.600.
Flanigen, Edith M.: *See*—
Wilson, Stephen T.; and Flanigen, Edith M., 4,567,029, Cl. 423-306.000.
Flautt, Martin C.: *See*—
Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., 4,567,102, Cl. 428-391.000.
Fleissner, Gerold, to Vepa Aktiengesellschaft. Apparatus for hooping a fiber bale in a fiber bale press. 4,566,378, Cl. 100-26.000.
Fleming, David L.: *See*—
Gershenson, Meir; Sweeny, Mark F.; Long, Dennis D.; and Fleming, David L., 4,567,438, Cl. 324-248.000.
Fleming, William J.; and Raceu, Dumitru, to TRW Inc. Noncontact torque sensor. 4,566,338, Cl. 73-862.360.
Fletcher, William T.: *See*—
Blackmore, Phillip W.; Fletcher, William T.; and Burn, Terry B., 4,567,078, Cl. 428-119.000.
Flink, Claes H., to Aktiebolaget IRO. Pressure medium driven machine tool. 4,566,849, Cl. 415-92.000.
Flood, William S.: *See*—
Goldberg, David A.; Flood, William S.; Arthur, Allan A.; and Voelker, Ferdinand, 4,567,452, Cl. 332-7.000.
Flotow, Richard A.; and Tennant, William M., to Dana Corporation. Clutch with a piloted and spring loaded driven disc hub. 4,566,572, Cl. 192-70.120.
Flugan, David, to General Electric Company. Ballast circuit having electromagnetic interference (EMI) reducing means for an improved lighting unit. 4,567,404, Cl. 315-205.000.
FMC Corporation: *See*—
Villa, Ferruccio; and Castelli, Fabio, 4,566,599, Cl. 212-160.000.
Foch, Henri; and Roux, Jacques, to Agence Nationale pour la Valorisation et la Recherche (A.N.V.A.R.). Static semi-conductor electrical energy converter assembly. 4,567,553, Cl. 363-98.000.
Fogarty, Terence M., to Mentor Corporation. Penile prosthesis device. 4,566,446, Cl. 128-79.000.
Foglia, Vincent: *See*—
Minier, Jean; Barthelemy, Herve ; and Foglia, Vincent, 4,566,824, Cl. 405-202.000.
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, to Bayerische Motoren Werke Aktiengesellschaft. Transmission method for variable measured values from vehicle wheels utilizing ambient temperature compensation. 4,567,459, Cl. 340-58.000.
Fontenot, John E., Jr.: *See*—
Rao, M. Vikram; and Fontenot, John E., Jr., 4,566,318, Cl. 73-151.000.
Force, Louis W. Methane - carbon dioxide scrubbing method and system. 4,566,278, Cl. 60-618.000.
Ford Aerospace & Communications Corporation: *See*—
Buczek, Carl J., 4,566,788, Cl. 356-4.000.
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,566,432, Cl. 126-438.000.
Foret S.A.: *See*—
Ochoa, Victor M.; and Pueyo, Ricardo, 4,566,998, Cl. 260-369.000.
Fors, Henry, to Forss Union AB. Arrangement in display and storage racks. 4,566,598, Cl. 211-96.000.
Fors, Jan: *See*—
Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, 4,567,255, Cl. 536-30.000.
Forss Union AB: *See*—
Fors, Henry, 4,566,598, Cl. 211-96.000.
Forster, Karl-Heinz: *See*—
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.
Foulon, Bernard M.: *See*—
Bernard, Alain M.; Le Clerc, Georges-Marie J.; and Foulon, Bernard M., 4,566,328, Cl. 73-517.00B.
Fourcadier, Chantal: *See*—
Grollier, Jean F.; and Fourcadier, Chantal, 4,566,875, Cl. 8-406.000.

Fournell, Hans-Dieter: *See*—
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, 4,567,459, Cl. 340-58.000.

Fournier, Eugene, to Sovonics Solar Systems. Apparatus for microwave glow discharge deposition. 4,566,403, Cl. 118-718.000.

Fowler, David P.: *See*—
Baker, John E.; and Fowler, David P., 4,567,051, Cl. 426-438.000.

Fox, Daniel W.; and Shafer, Sheldon J., to General Electric Company. Melt preparation of polyamide by amide ester interchange. 4,567,249, Cl. 528-347.000.

Fox, Mark A.: *See*—
Lewis, Edward L.; Parr, Jack E.; Fox, Mark A.; and Fuson, Robert L., 4,566,138, Cl. 623-22.000.

Framatome & Cie: *See*—
Cohen, Serge; and Nguyen, Gilbert H. K., 4,566,310, Cl. 73-9.000.

Francois, Daniel; and Mercey, Gilles, to La Calhene, Societe Anonyme. Actuator. 4,567,417, Cl. 318-632.000.

Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,567,049, Cl. 426-275.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Oellerer, Friedrich, 4,566,389, Cl. 104-3.000.

Fredericks, Edward C.; Greenhaus, Herbert L.; Nanda, Madan M.; and Via, Giorgio G., to International Business Machines Corporation. Multi-level resist image reversal lithography process. 4,567,132, Cl. 430-312.000.

Freed, James C.: *See*—
Durst, Tony; Glinski-Oomen, Margaret B.; and Freed, James C., 4,567,253, Cl. 536-18.100.

French, Geoffrey R.; Peltret, Pierre H.; and Chalke, Brian J., to Lucas Industries public limited company. Engine systems. 4,566,271, Cl. 60-286.000.

Frenzel, Werner: *See*—
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.

Fricker, Urs: *See*—
Martin, Henry; and Fricker, Urs, 4,566,901, Cl. 71-105.000.

Friederichs, Karl-Heinz; and Schlapkohl, Joachim, to Blohm & Voss AG. System for controlling the movement of an industrial manipulator. 4,567,415, Cl. 318-565.000.

Friedman, Harvey W.; Kohli, Jerry L.; and DeMur, Cynthia L., to Buxton, Inc. Folder with rewritable surface for checkbooks and the like. 4,566,721, Cl. 281-31.000.

Friedman, Robert H., to Texaco Inc. Method of recovering hydrocarbon from oil shale. 4,566,964, Cl. 208-8.0LE.

Friesner, Karl; Bege, Dietmar; Erbse, Dietmar; and Meininger, Siegfried, to Kraftwerk Union Aktiengesellschaft. Treating weak-to medium-active ion exchanger resins in a drying vessel. 4,566,204, Cl. 34-15.000.

Frisch, Herbert, to ENFO Grundlagenforschungs AG. Electropneumatic signal converter. 4,567,394, Cl. 310-330.000.

Frito-Lay, Inc.: *See*—
Baker, John E.; and Fowler, David P., 4,567,051, Cl. 426-438.000.

Frobose, James W., to Jasper Corporation, The. Upholstered seat for clean rooms. 4,566,735, Cl. 297-452.000.

Frosch, Werner, to Hollingsworth GmbH. Universal textile machine for optionally manufacturing longitudinally oriented or randomly oriented fibre fleeces. 4,566,153, Cl. 19-98.000.

Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., to Upjohn Co., The. Preparation of carbamates from organic carbonates and aromatic ureas. 4,567,287, Cl. 560-024.000.

Frykendahl, Bjorn. Casting nozzle. 4,566,614, Cl. 222-603.000.

Fuchizawa, Tetsuro: *See*—
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,567,497, Cl. 346-200.000.

Fuchs, Uwe: *See*—
Reimann, Hans; and Fuchs, Uwe, 4,566,971, Cl. 210-616.000.

Fuji Photo Film Co., Ltd.: *See*—
Akisada, Masahide; Ookawa, Norio; and Takamura, Yuji, 4,566,767, Cl. 354-76.000.
Arakawa, Jun; and Watanabe, Toshiyuki, 4,567,135, Cl. 430-505.000.
Ishizuka, Akio; Yamazaki, Hisashi; and Yamazaki, Kikuo, 4,567,371, Cl. 250-483.100.
Iwamoto, Shoji; and Kubota, Kazuo, 4,566,647, Cl. 242-67.10R.
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.
Miyoshi, Takahito; Okutu, Toshimitu; Utumi, Masahiro; and Fujiyama, Masaaki, 4,567,063, Cl. 427-128.000.
Ogata, Yasuhiro; and Maekawa, Masakazu, 4,567,496, Cl. 346-200.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,567,497, Cl. 346-200.000.

Fuji Photo Optical Co., Ltd.: *See*—
Tsuchiya, Kazumichi, 4,567,526, Cl. 358-227.000.

Fuji Xerox Co., Ltd.: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; Hisatake, Masayuki; and Ohmori, Takashi, 4,567,488, Cl. 346-76.0PH.
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, 4,567,374, Cl. 250-578.000.

Fujii, Hiroshi: *See*—
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, 4,567,455, Cl. 335-16.000.

Fujii, Tadashi; and Hayakawa, Yoshinori, to Terumo Kabushiki Kaisha. Ultrasonic measurement method, and apparatus therefor. 4,566,330, Cl. 73-599.000.

Fujimura, Kazumasa: *See*—
Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, 4,567,089, Cl. 428-213.000.

Fujioka, Kazuyoshi, to Nissan Motor Co., Ltd. Clutch drum of automatic transmission. 4,566,571, Cl. 192-70.200.

Fujioka, Takafumi: *See*—
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, 4,567,187, Cl. 514-312.000.

Fujisawa, Hideya: *See*—
Ninomiya, Masakazu; Fujisawa, Hideya; Omori, Norio; and Suzuki, Atsushi, 4,566,419, Cl. 123-489.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,567,275, Cl. 548-128.000.

Fujita, Takashi: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,566,897, Cl. 71-88.000.

Fujitsu Limited: *See*—
Fukuda, Takeshi, 4,567,501, Cl. 357-51.000.
Sato, Takuso; Ichida, Nobuyuki; and Miwa, Hirohide, 4,566,460, Cl. 128-660.000.
Yasuda, Yasushi; Enomoto, Hiromu; Shimauchi, Yoshiki; and Tahara, Akinori, 4,567,380, Cl. 307-290.000.
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, 4,567,470, Cl. 340-365.00C.

Fujiyama, Masaaki: *See*—
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.
Miyoshi, Takahito; Okutu, Toshimitu; Utumi, Masahiro; and Fujiyama, Masaaki, 4,567,063, Cl. 427-128.000.

Fukano, Sakuzo: *See*—
Kawamura, Jun; and Fukano, Sakuzo, 4,566,518, Cl. 164-53.000.

Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Carbonaceous, five-layer fuel cell electrode substrate with elongated holes for feeding reactant gases. 4,567,086, Cl. 428-166.000.

Fukuda, Satoru: *See*—
Mimura, Yoshiki; Arai, Tetsuji; and Fukuda, Satoru, 4,567,352, Cl. 219-405.000.

Fukuda, Takeshi, to Fujitsu Limited. Resistor structure in integrated injection logic. 4,567,501, Cl. 357-51.000.

Fukuda, Tatemi: *See*—
Miyazaki, Tsutomu; Fukuda, Tatemi; and Yoshimine, Kazuya, 4,566,263, Cl. 57-276.000.

Fulmer, John W., to General Electric Company. Process for preparing acetone and phenol. 4,567,304, Cl. 568-385.000.

Fulton Manufacturing Corporation: *See*—
Ebey, Edward; and Richter, Karl E., 4,566,674, Cl. 254-345.000.

Funakoshi, Yasunobu: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,566,897, Cl. 71-88.000.

Fung, Alexander P., to Dow Chemical Company, The. Liquid phase halogen exchange of (trichloromethyl) pyridines to (trifluoromethyl)-pyridines. 4,567,273, Cl. 546-345.000.

Fung, Alexander P.: *See*—
Gatlin, Janice E.; Van Dort, Mark A.; Wilson, Charles A.; and Fung, Alexander P., 4,567,274, Cl. 546-345.000.

Furrow, Roger W.; and Hartsell, Hal C., to Gilbarco Inc. Insertion tube liquid evacuator system for vapor recovery hose. 4,566,504, Cl. 141-59.000.

Fursich, Manfred; Treiber, Helmut; Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Method of copying color exposures. 4,566,786, Cl. 355-77.000.

Furukawa, Hideaki, to Canon Kabushiki Kaisha. Remaining amount indicator. 4,566,547, Cl. 177-46.000.

Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,566,710, Cl. 280-91.000.

Furukawa, Yoshimi: *See*—
Koizumi, Yusuke; Furukawa, Yoshimi; and Sano, Shoichi, 4,566,711, Cl. 280-91.000.

Fuse, Mario: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, 4,567,374, Cl. 250-578.000.

Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., to University of Dayton. Holographic optical processing method and apparatus. 4,566,757, Cl. 350-162.120.

Fuson, Robert L.: *See*—
Lewis, Edward L.; Parr, Jack E.; Fox, Mark A.; and Fuson, Robert L., 4,566,138, Cl. 623-22.000.

Fustier, Guy. Device for classifying handled objects. 4,566,595, Cl. 209-545.000.

G. A. Platon Limited: *See*—
Smart, Michael G., 4,566,337, Cl. 73-861.560.

G. D. Searle & Co.: *See*—
Chorvat, Robert J.; Prodan, Kathleen A.; and Schulz, John A., 4,567,270, Cl. 546-183.000.
Fellner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., 4,567,189, Cl. 514-338.000.

G & J Industries, Inc.: *See*—
Arthur, Gregory L.; and Hunnicutt, Wayne E., 4,566,717, Cl. 280-701.000.

Gaa, Peter C.; and Dana, David E., to PPG Industries, Inc. Aqueous dispersion, internally silylated and dispersed polyurethane resins, and surfaces containing same. 4,567,228, Cl. 524-588.000.

GAF Corporation: *See*—
Canfield, V. Robert; Woodring, William J.; and Kubiak, Mira C., 4,567,079, Cl. 428-131.000.
Waxman, Burton H.; and Lin, I. Sioun, 4,567,035, Cl. 424-47.000.

Gajdos, Benedikt: *See*—
Durr, Manfred; Gajdos, Benedikt; Gneuss, Klaus-Dieter; Harhausen, Ekkehard; and Seidel, Jurgen, 4,567,202, Cl. 514-656.000.

Gajria, Chandrasen; and Ozari, Yehuda, to Celanese Corporation. Water-swellable crosslinked polymeric microgel particles and aqueous dispersions of organic film-forming resins containing the same. 4,567,246, Cl. 526-318.440.

Ganz, Josef: *See*—
Honegger, Heinz; and Ganz, Josef, 4,566,143, Cl. 14-16.500.

Gardner, Hugh C.: *See*—
Qureshi, Shahid; and Gardner, Hugh C., 4,567,216, Cl. 523-400.000.

Garner, John N., to Northern Telecom Limited. Manufacture of telecommunications cable core units. 4,566,264, Cl. 57-314.000.

Garthoff, Bernward: *See*—
Niemers, Ekkehard; Knorr, Andreas; and Garthoff, Bernward, 4,567,188, Cl. 514-332.000.

Garver, Christian J.: *See*—
Elliott, Kirk W.; Garver, Christian J.; Kayser, John P.; and Dombroski, Robert M., 4,566,560, Cl. 184-15.100.

Gasti-Verpackungsmachinen GmbH: *See*—
Turtschan, Alfons; and Drechsler, Herbert, 4,566,591, Cl. 206-427.000.

Gatlin, Janice E.; Van Dort, Mark A.; Wilson, Charles A.; and Fung, Alexander P., to Dow Chemical Company, The. Chlorine exchange for fluorine in 2-fluoropyridine compounds. 4,567,274, Cl. 546-345.000.

Gausepohl, Hermann: *See*—
Echte, Adolf; Gausepohl, Hermann; Hambrecht, Juergen; and Gerberding, Karl, 4,567,232, Cl. 525-53.000.

Gauthier, Maurice, to Cofpa. Papermaker's fabric constituted by plastic spirals. 4,567,077, Cl. 428-114.000.

Gauthier, Michel: *See*—
Beau, Jean F.; and Gauthier, Michel, 4,566,740, Cl. 308-10.000.

Gavagan, James A.; and Brennan, William E., to Irvin Industries, Inc. End release inverse clevis buckle. 4,566,160, Cl. 24-637.000.

GCA Corporation: *See*—
Rosenthal, David, 4,567,361, Cl. 235-462.000.

Geary, Nelse, Sr. Bait casting device and method. 4,566,217, Cl. 43-19.000.

Gebelius, Sven R. V. Method for the manufacture of a conical tubular member. 4,566,300, Cl. 72-63.000.

Gebler, Eugen, to Bayerische Motoren Werke AG. Testing device apparatus and method for tire pressure of automotive vehicle wheels. 4,567,460, Cl. 340-58.000.

Gehret, Jean-Claude; and Traber, Walter, to Ciba-Geigy Corporation. Pesticidal phenylhydrazonopyrrolidines. 4,567,190, Cl. 514-343.000.

Geist, Michael: *See*—
Ott, Gunther; Dobbelstein, Arnold; Geist, Michael; Schon, Georg; and Ahlers, Klaas, 4,566,963, Cl. 204-181.700.

Geisthoff, Hubert, to Jean Walterscheid GmbH. Overload clutch. 4,566,570, Cl. 192-56.00R.

Gelbart, Daniel. Optical tape recorder using linear scanning. 4,567,585, Cl. 369-97.000.

Gendron, Wilfred H., to Westvaco Corporation. Tamper detection envelope. 4,566,627, Cl. 229-81.000.

General Company Limited: *See*—
Ohtsu, Tadatoshi; and Yamahata, Takashi, 4,567,113, Cl. 428-480.000.

General Dynamics Pomona Division: *See*—
Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., 4,566,656, Cl. 244-3.110.

General Electric Company: *See*—
Aloi, Anthony J.; Brooks, George D.; and Prince, Ronald E., 4,566,580, Cl. 193-48.000.
Bloomer, Milton D., 4,567,425, Cl. 323-237.000.
Flugan, David, 4,567,404, Cl. 315-205.000.
Fox, Daniel W.; and Shafer, Sheldon J., 4,567,249, Cl. 528-347.000.
Fulmer, John W., 4,567,304, Cl. 568-385.000.
Giles, Harold F., Jr., 4,567,105, Cl. 428-412.000.
Liu, Nan-I; and van der Meer, Roelof, 4,566,990, Cl. 252-503.000.
McVey, Charles I., 4,567,396, Cl. 313-25.000.

General Motors Corporation: *See*—
Graham, Donald E., 4,567,412, Cl. 318-483.000.
Wicke, Brian G., 4,566,565, Cl. 188-322.210.

General Pneumatics Corporation: *See*—
Halavais, Richard A., 4,566,291, Cl. 62-402.000.
Halavais, Richard A., 4,566,862, Cl. 417-189.000.

General Signal Corporation: *See*—
Salzman, Ronald N., 4,566,801, Cl. 366-343.000.

Georget, Jean-Pierre, to Fives-Cail Babcock. Method of manufacturing a cylinder for a sugar mill. 4,566,165, Cl. 29-121.600.

Geotechnical Digital Systems Limited: *See*—
Menzies, Bruce K., 4,566,868, Cl. 417-572.000.

Gerberding, Karl: *See*—
Echte, Adolf; Gausepohl, Hermann; Hambrecht, Juergen; and Gerberding, Karl, 4,567,232, Cl. 525-53.000.

Gerich, Josef: *See*—
Schulze, Werner; Gerich, Josef; Scheef, Emil; and Dautel, Heinz, 4,566,723, Cl. 285-86.000.

German, John G.; Benjamin, Abraham; and Stirling, James F., to Canadian Patents & Development Ltd. Societe Canadienne des Brevets et d'Exploitation Limited. Navigational aid alerting system. 4,566,336, Cl. 73-772.000.

Gershenson, Meir; Sweeny, Mark F.; Long, Dennis D.; and Fleming, David L., to Sperry Corporation. SQUID Canister with conical coupling cavity. 4,567,438, Cl. 324-248.000.

Gerster, John F., to Riker Laboratories, Inc. Intermediates for the preparation of 6,7-dihydro-8-(imidazol-1-yl)-5-methyl-1-oxo-1H,5H-benzo[ij]quinolizine-2-carboxylic acids. 4,567,269, Cl. 546-167.000.

Geschwind, Gary I.: *See*—
Bloom, William G.; and Geschwind, Gary I., 4,566,183, Cl. 29-825.000.

Gey, Mathias; Grote, Jurgen; Pittel, Horst; Samol, Gerd W.; and Zelt, Rainer, to Metzeler Kautschuk GmbH. Floor covering, especially for airplanes. 4,567,085, Cl. 428-163.000.

Geyer, Gerhard: *See*—
Bauer, Otto; Eberl, Lernhard; Geyer, Gerhard; and Straubel, Max, 4,566,421, Cl. 123-502.000.

Ghibely, Bruno, to Esco Metallwaren Martin Huhnken. Striking apparatus for fasteners. 4,566,622, Cl. 227-120.000.

Ghyczy, Miklos: *See*—
Posanski, Ulrich; Ghyczy, Miklos; Bauer, Kurt-Heinz; and Wendel, Armin, 4,567,161, Cl. 514-23.000.

Giachetti, Antonio: *See*—
Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,567,178, Cl. 514-215.000.

Gianelos, James: *See*—
Arner, Russell E.; Emrich, Ronald J.; Gianelos, James; and Haynes, Marlon L., 4,566,293, Cl. 62-514.00R.

Gibaud, Michel: *See*—
Lecomte, Daniel; and Gibaud, Michel, 4,567,589, Cl. 370-58.000.

Giebeler, James F. Pressure balanced ball valve. 4,566,672, Cl. 251-192.000.

Giess, Jean: *See*—
Irvine, Stuart J. C.; Mullin, John B.; and Giess, Jean, 4,566,918, Cl. 148-175.000.

Gigante, Sergio, to Danieli & C. Officine Meccaniche S.p.A. Device to bundle rolled bars or rolled sections. 4,566,833, Cl. 414-30.000.

Gigli, Mauro: *See*—
de Castiglione, Roberto ; Perseo, Giuseppe; Gigli, Mauro; and Hecht, Barbara, 4,567,162, Cl. 514-16.000.

Gilbarco Inc.: *See*—
Furrow, Roger W.; and Hartsell, Hal C., 4,566,504, Cl. 141-59.000.

Giles, Harold F., Jr., to General Electric Company. Multilayer polycarbonate article. 4,567,105, Cl. 428-412.000.

Gilliom, Laura R.: *See*—
Grubbs, Robert H.; and Gilliom, Laura R., 4,567,244, Cl. 526-160.000.

Gilmore, Arthur H.: *See*—
Alie, Enrique; Gilmore, Arthur H.; and Mack, Henry J., Jr., 4,567,547, Cl. 362-154.000.

Gilmour, Alexander, to Venture Technology Limited. Insulating seal for electrochemical cells. 4,567,121, Cl. 429-181.000.

Gindy, Sherif: *See*—
Amlani, Kish; and Gindy, Sherif, 4,567,377, Cl. 307-112.000.

Gingras, Richard E., to United Technologies Corporation. Jet engine removable support assembly. 4,566,269, Cl. 60-226.100.

Githens, Charles J., to Githens, Charles J. Stable mixture of crosslinkable components promptly activatable as acting treating agents. 4,566,979, Cl. 252-8.55C.

Givaudan Corporation: *See*—
Lamparsky, Dietmar; and Kaiser, Roman, 4,567,291, Cl. 560-225.000.

Glass, Erich; and Heynisch, Hinrich. Fast-heating cathode. 4,567,071, Cl. 428-35.000.

Glenn, W. K., III: *See*—
Jones, John E.; and Glenn, W. K., III, 4,566,884, Cl. 55-357.000.

Gliemeroth, Georg; Speit, Burkhard; and Krolla, Hans-Georg, to Schott-Glaswerke. Scintillation glass. 4,566,987, Cl. 252-301.40F.

Glinski-Oomen, Margaret B.: *See*—
Durst, Tony; Glinski-Oomen, Margaret B.; and Freed, James C., 4,567,253, Cl. 536-18.100.

Gneuss, Klaus-Dieter: *See*—
Durr, Manfred; Gajdos, Benedikt; Gneuss, Klaus-Dieter; Harhausen, Ekkehard; and Seidel, Jurgen, 4,567,202, Cl. 514-656.000.

Goetchius, Ronald J.: *See*—
Collins, Michael J.; and Goetchius, Ronald J., 4,566,312, Cl. 73-32.00A.

Going, Walter S., III, to Camco, Incorporated. Solenoid actuated well safety valve. 4,566,534, Cl. 166-66.400.

Goldberg, David A.; Flood, William S.; Arthur, Allan A.; and Voelker, Ferdinand, to United States of America, Energy. Broad-band beam buncher. 4,567,452, Cl. 332-7.000.

Goldman, Michael B.; and Price, Frederick, to Wessel Company, The. Booklet with detachable envelope. 4,566,720, Cl. 281-15.00R.

Goldsmith, Herbert, to Pacific Scientific Company. Fluid sample cell comprising Fresnel sectors. 4,566,791, Cl. 356-246.000.

Goldthorp, David C.: *See*—
Embree, David M.; Goldthorp, David C.; Longenecker, Howard H.; and Vogelpohl, David R., 4,567,333, Cl. 179-84.00T.

Goldwasser, David J.; and Oertel, Richard W., III, to Upjohn Co., The. Novel polymer blends. 4,567,236, Cl. 525-127.000.

Gooden, Richmond A., to United Aircraft Products, Inc. Pressure operated shuttle valve. 4,566,530, Cl. 165-36.000.

Gooding, Elwyn R. Inflatable baffled liner for protective headgear and other protective equipment. 4,566,137, Cl. 2-413.000.

Goodman, Alvin M., to RCA Corporation. Method for revealing semiconductor surface damage using surface photovoltage (SPV) measurements. 4,567,431, Cl. 324-158.00R.

Goodnough, Mark A., to Santa Barbara Research Center. Switched capacitor transresistance amplifier. 4,567,363, Cl. 250-214.00A.

Goodyear Aerospace Corporation: *See*—
Turner, Patrick E., 4,566,237, Cl. 52-269.000.

Goodyear Tire & Rubber Company, The: *See*—
Brandyberry, Dennis R.; and Rye, Grover W., 4,566,261, Cl. 57-212.000.

Goossens, Urbanus P. M.; and Fierens, Gustaaf E. M., to U.S. Philips Corporation. Flat-diaphragm transducer and method of manufacturing such a transducer. 4,567,327, Cl. 179-115.50R.

Gorlov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., to Donetsky Nauchno-Issledovatelsky Ugolny Institut. Angle scraper chain face conveyor. 4,566,587, Cl. 198-732.000.

Gossler, Werner; Strube, Anneliese; and Zurheide, Manfred, to International Business Machines Corporation. Gate insulation layer and method of producing such a structure. 4,566,173, Cl. 29-571.000.

Goto, Eiichi; and Ohta, Hiroshi, to Rikagaku Kenkyusho. Fluxoid type superconducting logic element. 4,567,383, Cl. 307-415.000.

Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,567,275, Cl. 548-128.000.

Goto, Kunifumi; Sugiura, Manabu; and Suzuki, Shinichi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Rotary compressor operable under a partial delivery capacity. 4,566,863, Cl. 417-295.000.

Goto, Sumio: *See*—
Sakuma, Kuniharu; and Goto, Sumio, 4,566,396, Cl. 112-302.000.

Gottlieb Guhring: *See*—
Reinauer, Josef, 4,566,828, Cl. 407-48.000.

Gottling, Helmut: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,566,196, Cl. 33-125.00R.

Gottzein, Eveline: *See*—
Bittner, Helmut; Gottzein, Eveline; and Surauer, Michael, 4,567,564, Cl. 364-434.000.

Goudsche Machinefabriek B.V.: *See*—
van der Schoot, Peter W. C., 4,566,375, Cl. 99-348.000.

Graham, Charles R.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,567,158, Cl. 502-209.000.

Graham, Donald E., to General Motors Corporation. Automatic wiper actuator for a vehicle window. 4,567,412, Cl. 318-483.000.

Graham, John A. Rotatable platforms. 4,566,405, Cl. 119-14.040.

Grain Processing Corporation: *See*—
Hubbard, E. Daniel; Harvey, Richard D.; and Hogen, Mark L., 4,566,910, Cl. 127-70.000.

Granatstein, Victor L.: *See*—
Barnett, Larry R.; Lau, Yue-Ying; Chu, Kwo R.; and Granatstein, Victor L., 4,567,401, Cl. 315-5.000.

Granberg, Bengt: *See*—
Eriksson, Stig; Granberg, Bengt; and Westberg, Erik, 4,566,741, Cl. 312-194.000.

Grapha-Holding Aktiengesellschaft: *See*—
Linder, Heinz, 4,566,582, Cl. 198-367.000.

Graphic Controls Corporation: *See*—
Lawton, William R., 4,567,019, Cl. 422-57.000.

Grau, Werner: *See*—
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.

Graves, Victoria, to Exxon Research & Engineering Co. Polymerization catalyst comprising copulverized solid magnesium compound and solid halide of scandium. 4,567,153, Cl. 502-113.000.

Gray, James S.; Chamberlin, James W.; McBride, Alan L.; and Schreiner, Peter G., III. Digital audio satellite transmission system. 4,567,591, Cl. 370-109.000.

Great Lakes Chemical Corporation: *See*—
Petiet, Thomas J., 4,567,218, Cl. 524-373.000.

Green, David T.; and Aranyi, Ernie, to United States Surgical Corporation. Articulated surgical fastener applying apparatus. 4,566,620, Cl. 227-19.000.

Greene, Lindsey C.: *See*—
De Witt, Nick; and Greene, Lindsey C., 4,566,714, Cl. 280-404.000.

Greenhaus, Herbert L.: *See*—
Fredericks, Edward C.; Greenhaus, Herbert L.; Nanda, Madan M.; and Via, Giorgio G., 4,567,132, Cl. 430-312.000.

Greenwood, Arthur R., to UOP Inc. Apparatus for facilitating sampling of particulate matter passing from one treatment zone to another. 4,567,022, Cl. 422-144.000.

Greenwood, Arthur R.; Burgard, Jeffrey E.; and Throndson, Roger L., to UOP Inc. Multiple-stage reactor system for a moving catalyst bed. 4,567,023, Cl. 422-192.000.

Greenwood, John C., to International Standard Electric Corporation. Resonator having optical feedback coupling. 4,567,451, Cl. 331-155.000.

Gregory, Francis J.: *See*—
Wei, Peter H. L.; and Gregory, Francis J., 4,567,267, Cl. 546-114.000.

Greguss, Pal, to Budapesti Muszaki Egyetem. Panoramic imaging block for three-dimensional space. 4,566,763, Cl. 350-441.000.

Greiner, Waldemar H.: *See*—
Arnoldt, Peter J.; and Greiner, Waldemar H., 4,566,724, Cl. 285-364.000.

GRETAG Aktiengesellschaft: *See*—
Kunz, Rino E., 4,567,362, Cl. 250-201.000.

Griffiths, Anthony C. M., to Hyman International Limited. Production of foams. 4,567,008, Cl. 264-40.500.

Griffiths, Thomas W., to Harvey Hubbell Incorporated. High speed trolley harp assembly. 4,567,335, Cl. 191-59.100.

Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, to Bayer Aktiengesellschaft. Elastomeric block copolyamides. 4,567,226, Cl. 524-538.000.

Grimmer, Johannes; and Horn, Hans C., to BASF Aktiengesellschaft. Purification of riboflavin. 4,567,262, Cl. 544-251.000.

Groen, Robertus W. C.; de Jonge, Cornelis A. M.; Schwartz, Lawrence M.; and van Lier, Johannes C., to U.S. Philips Corporation. Apparatus for reading a disc-shaped record carrier. 4,567,534, Cl. 358-342.000.

Groll, Hartmut. Tile block. 4,566,235, Cl. 52-220.000.

Grollier, Jean F.; and Fourcadier, Chantal, to L'Oreal. Two-stage process for dyeing keratin fibres and composition for use therein. 4,566,875, Cl. 8-406.000.

Grosscurt, Arnoldus C.: *See*—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,567,295, Cl. 564-44.000.

Grossman, Matthew: *See*—
Faber, Marcel; Bernstein, Jerome D.; and Grossman, Matthew, 4,567,145, Cl. 435-161.000.

Grote, Jurgen: *See*—
Gey, Mathias; Grote, Jurgen; Pittel, Horst; Samol, Gerd W.; and Zelt, Rainer, 4,567,085, Cl. 428-163.000.

Groth, John P., to Andersen Corporation. Shock absorbent dunnage device. 4,566,831, Cl. 410-117.000.

Grove, Michael M.: *See*—
Bateman, Charles D.; Grove, Michael M.; Noland, Lyle J.; and Ward, Wallace E., 4,567,483, Cl. 340-970.000.

Grove Valve and Regulator Company: *See*—
Chow, Peter C. M.; and Connolly, Walter L., 4,566,488, Cl. 137-613.000.

Grow, Harlow B. Span loaded flying wing control. 4,566,657, Cl. 244-90.00A.

Grubbs, Robert H.; and Gilliom, Laura R., to California Institute of Technology. Ring opening polymerization of mono-olefin ring compounds. 4,567,244, Cl. 526-160.000.

Gruetzmacher, Gordon D., to Pfizer Inc. Indigoid dyes. 4,567,048, Cl. 426-250.000.

Gruhler, Siegfried; and Wolf, Michael, to Societe Anonyme des Ets. Pierre Roch. Sliding caliper. 4,566,199, Cl. 33-143.00M.

Grzina, Anthony, to Warman International Limited. Pump. 4,566,850, Cl. 415-128.000.

GTE Business Communication Systems, Inc.: *See*—
Smith, Louis W.; and Csapo, Janos I., 4,567,324, Cl. 179-27.0FH.

GTE Laboratories Incorporated: *See*—
Bencuya, Izak; and Cogan, Adrian I., 4,566,172, Cl. 29-571.000.
Carlsen, W. John; and Melman, Paul, 4,566,761, Cl. 350-401.000.

Guerrier, Claude: *See*—
Catrain, Yves; Guerrier, Claude; and Revol, Jacques, 4,567,092, Cl. 428-246.000.

Gur Optics and Systems, Ltd.: *See*—
Gur, Yehoshua, 4,566,766, Cl. 353-122.000.

Gur, Yehoshua, to Gur Optics and Systems, Ltd. Image transmission devices. 4,566,766, Cl. 353-122.000.

Gussis, Gene L., to Atlantic Richfield Co. Heavy oil recovery. 4,566,537, Cl. 166-261.000.

Gustafson, John A.; and Dahlstrom, D. Richard, to Dahlstrom Display, Inc. Modular display unit. 4,566,211, Cl. 40-605.000.

Gysling, Walter, to National Computer Systems. Automatic sheet feed mechanism. 4,566,684, Cl. 271-117.000.

Haage, Hans-Jurgen: *See*—
Panoch, Hans J.; Feldmann, Rainer; Hinn, Hans; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,566,931, Cl. 156-330.900.

Haak, Frederik W., to Shell Oil Company. Gas liquefaction process. 4,566,885, Cl. 62-9.000.

Haas, Charles J.: *See*—
Bartlett, Robert L.; Haas, Charles J.; and Legler, John G., 4,566,510, Cl. 144-1.00C.

Haas, Daniel D., to Eastman Kodak Company. Method for calibrating a reflectometer containing black and white references displaced from the sample position. 4,566,798, Cl. 356-448.000.

Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,567,049, Cl. 426-275.000.

Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Process and apparatus for producing filled wafer blocks. 4,567,049, Cl. 426-275.000.

Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,567,049, Cl. 426-275.000.

Habeeb, Jacob J.; and Coupland, Keith, to Exxon Research and Engineering Co. Metal dithiobenzoates as lubricant additives. 4,566,982, Cl. 252-33.600.

Haberl, Karl; and Resch, Klaus, to Schmidle & Fitz, Film-Gerate-Verleih. Support wheel for a camera dolly. 4,566,391, Cl. 105-215.00R.

Hacker, Jay P.: *See*—
Hoffman, Lawrence A.; Hacker, Jay P.; and Miller, William M., 4,566,552, Cl. 180-69.210.

Hackleman, David E.; Adams, Richard F.; and Richling, Wayne P., to Hewlett-Packard Company. Use of an electronic vernier for evaluation of alignment in semiconductor processing. 4,566,193, Cl. 33-1.00D.

Haegh, Gerd S.: *See*—
Blindheim, Ulf; Haegh, Gerd S.; and Nilsen, Bjorn P., 4,567,313, Cl. 585-480.000.

Hagenbach, Germain; Maldonado, Paul; and Maurice, Jacques, to Elf France. Process for preparing bitumen-polymer compositions, application to these compositions of the obtention of coverings and mother solution of polymer usable for the obtention of the said compositions. 4,567,222, Cl. 524-476.000.

Hahnke, Manfred: *See*—
Buhler, Ulrich; Tappe, Horst; Bode, Albert; Hahnke, Manfred; and Roth, Kurt, 4,567,252, Cl. 534-882.000.

Haino, Kozo: *See*—
Emoto, Kazuhiro; and Haino, Kozo, 4,567,126, Cl. 430-59.000.

Halavais, Richard A., to General Pneumatics Corporation. Closed cycle cryogenic cooling apparatus. 4,566,291, Cl. 62-402.000.

Halavais, Richard A., to General Pneumatics Corporation. Fluid apparatus and methods, as for inflating inflatable structures. 4,566,862, Cl. 417-189.000.

Hale, Gilbert L.: *See*—
Borio, Donald C.; Borio, Richard W.; Hale, Gilbert L.; Mehta, Arun K.; and Tyler, Arnold L., 4,566,394, Cl. 110-347.000.

Hall, John H., to Micro Power Systems, Inc. Method of forming localized epitaxy and devices formed therein. 4,566,914, Cl. 148-1.500.

Halliburton Company: *See*—
Bomgardner, Charles T., 4,566,701, Cl. 277-58.000.
Stromberg, James L., 4,566,168, Cl. 29-517.000.

Hamaguchi, Iwao: *See*—
Hayashi, Yutaka; Hamaguchi, Iwao; and Kobayashi, Kiyohiko, 4,567,061, Cl. 427-93.000.

Hamano, Toshihisa: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, 4,567,374, Cl. 250-578.000.

Hamar, Martin R. Laser apparatus for effectively projecting the axis of rotation of a rotating tool holder. 4,566,202, Cl. 33-286.000.

Hambrecht, Juergen: *See*—
Echte, Adolf; Gausepohl, Hermann; Hambrecht, Juergen; and Gerberding, Karl, 4,567,232, Cl. 525-53.000.

Hameister, Rolf: *See*—
Weinberg, Ekkehard; and Hameister, Rolf, 4,567,068, Cl. 428-31.000.

Hammad, Adel: *See*—
Dobsa, Josip; and Hammad, Adel, 4,567,423, Cl. 322-58.000.

Hammann, Ingeborg: *See*—
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,567,168, Cl. 514-89.000.

Hammer, Hans: *See*—
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.

Hammer, Heinz; Kircher, Klaus; and Meyer, Rolf-Volker, to Bayer Aktiengesellschaft. Process for foaming thermoplastic aromatic polycarbonates. 4,567,210, Cl. 521-90.000.

Hammer, Rudolf: *See*—
Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,567,178, Cl. 514-215.000.

Hammon, Gordon R.: *See*—
Dolsen, Philip C.; Chandra, Satish; Hammon, Gordon R.; and Uren, William J., 4,567,482, Cl. 340-825.050.

Hanafi, Nabil, to Uraca Pumpenfabrik GmbH & Co. KG. Piston pump arrangement. 4,566,370, Cl. 92-59.000.

Hankins, Kevin T.; and Rivoli, Anthony L., to Harris Corporation. Critical dimension measurement structure. 4,566,192, Cl. 33-1.00B.

Hanse, Joel G., to Honeywell Inc. Apparatus for interference fringe shift sensing. 4,566,794, Cl. 356-350.000.

Hansel, Gernot: *See*—
Maier, Peter; Attinger, Karl; Sigel, Albert; Hansel, Gernot; Kutscher, Erwin; and Walter, Hartmut, 4,566,830, Cl. 409-182.000.

Hanselmann, Roland: *See*—
Meier, Linus; and Hanselmann, Roland, 4,567,481, Cl. 340-784.000.

Hansson, Per E. A.; and Jachimowicz, Felek, to W. R. Grace & Co. Wet strength material. 4,566,943, Cl. 162-168.200.

Hara, Kunio; Tanaka, Toshie; Shibayama, Teruji; Morisaki, Minoru; and Kaneko, Yoshio, to Nifco, Inc. Method for fixing stud on workpiece. 4,566,924, Cl. 156-73.500.

Harada, Kunihiko: *See*—
Sogabe, Yoji; Uchida, Katsumi; and Harada, Kunihiko, 4,567,093, Cl. 428-250.000.

Harada, Nozomu: *See*—
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,567,525, Cl. 358-213.000.

Haraguchi, Yukio: *See*—
Nishitsuji, Kazuichi; Aikawa, Eiichi; and Haraguchi, Yukio, 4,566,865, Cl. 417-363.000.

Harayama, Chiharu, to Junkosha Co., Ltd. Flexible flat cable. 4,567,321, Cl. 174-117.00F.

Harbison, William H., to Anderson Company of Indiana, The. Retainer clip for a wiper arm. 4,566,146, Cl. 15-250.340.

Harder, Burkhard: *See*—
Knoblauch, Karl; Harder, Burkhard; Heimbach, Heinrich; and Cosentino, Charles F., 4,566,282, Cl. 62-48.000.

Harder, Isaac E., to LTV Aerospace and Defense Company. Method of making carbon/carbon composites. 4,567,007, Cl. 264-29.500.

Harding, Kevin G.: *See*—
Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., 4,566,757, Cl. 350-162.120.

Hargett, Wyatt P., Jr.: *See*—
Collins, Michael J.; and Hargett, Wyatt P., Jr., 4,566,804, Cl. 374-14.000.

Harhausen, Ekkehard: *See*—
Durr, Manfred; Gajdos, Benedikt; Gneuss, Klaus-Dieter; Harhausen, Ekkehard; and Seidel, Jurgen, 4,567,202, Cl. 514-656.000.

Harris Corporation: *See*—
Cohen, Paul; and Young, William R, 4,567,578, Cl. 365-189.000.
Curtin, Leonard E., 4,567,330, Cl. 179-17.00E.
Falater, Scott L.; and Beasom, James D., 4,567,385, Cl. 307-443.000.
Hankins, Kevin T.; and Rivoli, Anthony L., 4,566,192, Cl. 33-1.00B.
Leebrick, David H., 4,566,796, Cl. 356-401.000.

Harris, James S.: *See*—
Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., 4,566,757, Cl. 350-162.120.

Harrison, George E.: *See*—
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,567,306, Cl. 568-455.000.

Hartsell, Hal C.: *See*—
Furrow, Roger W.; and Hartsell, Hal C., 4,566,504, Cl. 141-59.000.

Harvey Hubbell Incorporated: *See*—
Griffiths, Thomas W., 4,567,335, Cl. 191-59.100.
Neuroth, David H.; and Moscovici, Armand, 4,567,320, Cl. 174-103.000.

Harvey, Richard D.: *See*—
Hubbard, E. Daniel; Harvey, Richard D.; and Hogen, Mark L., 4,566,910, Cl. 127-70.000.

Haseda, Satoshi: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.

Hasegawa, Hiroshi; Shinzawa, Akira; and Kohno, Yoshiki, to Nippon Oil Co., Ltd. Flame-retardant electrical insulating oil composition. 4,566,994, Cl. 252-574.000.

Hasegawa, Katsumi; and Kanamori, Hiromitsu, to Toray Industries, Inc. Yarn feeding means and a yarn winder including the same. 4,566,643, Cl. 242-18.00R.

Haselby, Robert D.; Haugh, Samuel R.; and Stewart, Lowell J., to Hewlett-Packard Company. Apparatus and method for pen-lift system. 4,567,565, Cl. 364-520.000.

Haselgrove, John C. Vivo P-31 NMR imaging of phosphorus metabolites. 4,567,440, Cl. 324-309.000.

Hashimoto, Hitoshi: *See*—
Matsuse, Kohki; Hashimoto, Hitoshi; and Suzuki, Toshiaki, 4,567,555, Cl. 363-138.000.

Hashimoto, Seiji: *See*—
Tanaka, Nobuyoshi; Hashimoto, Seiji; and Kuwayama, Tetsuro, 4,567,510, Cl. 358-44.000.

Hashimoto, Shintaro; and Tanimoto, Akira, to Sharp Kabushiki Kaisha. Electronic language interpreter with faculties for memorizing and erasing new words externally applied thereto. 4,567,573, Cl. 364-900.000.

Hashizume, Soh: *See*—
Ooi, Kiyoshi; Morita, Michio; Suzuki, Kazuyoshi; Hashizume, Soh; and Yoshizawa, Hanako, 4,567,147, Cl. 435-237.000.

Hatchett, John D.: *See*—
Howell, William J.; and Hatchett, John D., 4,567,603, Cl. 375-65.000.

Hatfield, James C., to Union Carbide Corporation. Non-aqueous slurries used as thickeners. 4,566,977, Cl. 252-8.50C.

Hattori, Hideki: *See*—
Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, 4,567,089, Cl. 428-213.000.

Hattori, Kazuhide: *See*—
Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, 4,567,089, Cl. 428-213.000.
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.

Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, to Mitsubishi Petrochemical Co., Ltd. Thermoforming propylene polymer laminated sheet. 4,567,089, Cl. 428-213.000.

Hattori, Takeo; and Sasakura, Tohru, to Samtec Company Limited. Method non-destructively identifying different kinds of rolled steel for structural purposes. 4,567,427, Cl. 324-64.000.

Hatvany, Charles C. One piece window or door guard. 4,566,222, Cl. 49-56.000.

Haugh, Samuel R.: *See—*
Haselby, Robert D.; Haugh, Samuel R.; and Stewart, Lowell J., 4,567,565, Cl. 364-520.000.

Hauser, Kurt, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Axial fan arrangement. 4,566,852, Cl. 415-182.000.

Haussmann, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for demodulating time-discrete frequency-modulated signals. 4,567,442, Cl. 329-145.000.

Havens, Stephen J.: *See—*
Hergenrother, Paul M.; and Havens, Stephen J., 4,567,240, Cl. 525-328.100.

Havstad, Harold R., to Hudson Oxygen Therapy Sales Co. Percussor subassembly for generating gas bursts. 4,566,441, Cl. 128-40.000.

Hawley, Robert C. Electrical plug locking device. 4,566,297, Cl. 70-57.000.

Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Method of producing a semiconductor laser device. 4,567,060, Cl. 427-87.000.

Hayakawa, Yoshinori: *See—*
Fujii, Tadashi; and Hayakawa, Yoshinori, 4,566,330, Cl. 73-599.000.

Hayama, Kazuhide: *See—*
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.

Hayashi, Katsumi, to Lubrizol Corporation, The. Combination of carboxylic acylating agents substituted with olefin polymers of high and low molecular weight mono-olefins, derivatives thereof, and fuels and lubricants containing same. 4,566,983, Cl. 252-56.00R.

Hayashi, Yutaka; Hamaguchi, Iwao; and Kobayashi, Kiyohiko, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for manufacture of insulating film and interface between insulation film and semiconductor. 4,567,061, Cl. 427-93.000.

Haynes, Marlon L.: *See—*
Arner, Russell E.; Emrich, Ronald J.; Gianelos, James; and Haynes, Marlon L., 4,566,293, Cl. 62-514.00R.

HB Varix: *See—*
Loefqvist, Johan, 4,566,436, Cl. 128-1.00R.

Hecht, Barbara: *See—*
de Castiglione, Roberto ; Perseo, Giuseppe; Gigli, Mauro; and Hecht, Barbara, 4,567,162, Cl. 514-16.000.

Hecht, William; and Reyes, Pablo, to Phase Technology Corporation. Process for assembling a cone speaker. 4,566,178, Cl. 29-594.000.

Heckmann, Walter: *See—*
Naarmann, Herbert; Heckmann, Walter; Kohler, Gernot; and Simak, Petr, 4,567,250, Cl. 528-423.000.

Hedlund, Kurt A., to AT&T Bell Laboratories. Multiline error detection circuit. 4,567,595, Cl. 371-49.000.

Heemskerk, Rugerus S.: *See—*
v Engelenburg, Hendrik; and Heemskerk, Rugerus S., 4,566,744, Cl. 339-8.00L.

Hefty, Arpad: *See—*
Hefty, Dipl.-Ing. B.; and Hefty, Arpad, 4,566,648, Cl. 242-67.30R.

Hefty, Dipl.-Ing. B.; and Hefty, Arpad, to Hygolet AG. Device for applying and conveying a protective cover for a toilet seat. 4,566,648, Cl. 242-67.30R.

Heijnemans, Werner A. L., to U.S. Philips Corporation. Projection screen. 4,566,756, Cl. 350-126.000.

Heil Co., The: *See—*
Smith, Fred T., 4,566,840, Cl. 414-408.000.

Heimbach, Heinrich: *See—*
Knoblauch, Karl; Harder, Burkhard; Heimbach, Heinrich; and Cosentino, Charles F., 4,566,282, Cl. 62-48.000.

Hein, Hans-Rudolf: *See—*
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, 4,567,459, Cl. 340-58.000.

Heiser, Joachim; and Weigle, Dieter, to Robert Bosch GmbH. Control device for a hydrostatic drive. 4,566,274, Cl. 60-444.000.

Heitz, Walter: *See—*
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.

Held, Kurt. Window frame with laminated surfaces. 4,566,234, Cl. 52-209.000.

Held, Robert P., to Du Pont de Nemours, E. I., and Company. Process for image formation utilizing chemically soluble pigments. 4,567,129, Cl. 430-294.000.

Held, Robert P., to Du Pont de Nemours, E. I., and Company. Process for etching single photopolymer layer utilizing chemically soluble pigments. 4,567,130, Cl. 430-294.000.

Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Alcock, Philip, to Heller, Martin G. Apparatus and method of setting up apparatus for shaping and trimming the leads of integrated components. 4,566,503, Cl. 140-140.000.

Helmle, Theodor; and Weber, Kurt, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co KG. Regulator circuit for vehicle air conditioner. 4,566,528, Cl. 165-26.000.

Hemmer, Valentine J., to Allied Corporation. Contact assembly for an electrical connector. 4,566,752, Cl. 339-262.00R.

Henn, Arthur R.: *See—*
Monzyk, Bruce F.; and Henn, Arthur R., 4,567,284, Cl. 556-37.000.

Hennig, Kurt C. Knock-down dispenser pack for stacked articles. 4,566,596, Cl. 211-59.200.

Henrich, Gunter: *See—*
Hoffmann, Harald; Henrich, Gunter; and Waldhecker, Heinz-Dieter, 4,566,882, Cl. 55-100.000.

Henriott, Jay M., to Kimball International, Inc. Drawer slide clip. 4,566,743, Cl. 312-350.000.

Henry, Arnold W.; and Moser, Rabin, to Xerox Corporation. Heat and pressure fuser apparatus. 4,567,349, Cl. 219-216.000.

Henry, James W.; and Mumpower, Robert C., to Eastman Kodak Company. Method for continuously measuring the perimeter of wrapped objects of generally uniform cross-section. 4,567,372, Cl. 250-560.000.

Herb, Armin, to Hilti Aktiengesellschaft. Hand-held device for dispensing a multi-component substance. 4,566,610, Cl. 222-137.000.

Hergenrother, Paul M.; and Havens, Stephen J., to United States of America, National Aeronautics and Space Administration. Ethynyl terminated ester oligomers and polymers therefrom. 4,567,240, Cl. 525-328.100.

Hermann Finckh Maschinenfabrik GmbH & Co.: *See—*
Holz, Emil; and Hutzler, Hagen, 4,566,942, Cl. 162-4.000.

Hermes, Julius, to Martin Processing, Inc. Apparatus for winding yarn. 4,566,645, Cl. 242-35.50R.

Hero, Marc R.: *See—*
Arhan, Pierre J.; and Hero, Marc R., 4,566,465, Cl. 128-778.000.

Herota, Rosh N., to Tateyama, Tom; and K & H Distributors. Ratchet wrench assembly. 4,566,356, Cl. 81-62.000.

Hertel, Otto: *See—*
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.

Hertzler, Merle E., to RCA Corporation. Device for positioning and orienting kinescopes. 4,566,848, Cl. 414-749.000.

Herzog, Robert E.: *See—*
Bolenbaugh, Daniel L.; and Herzog, Robert E., 4,566,564, Cl. 188-73.330.

Hewlett-Packard Company: *See—*
Berger, Terry A., 4,566,949, Cl. 204-1.00T.
Hackleman, David E.; Adams, Richard F.; and Richling, Wayne P., 4,566,193, Cl. 33-1.00D.
Haselby, Robert D.; Haugh, Samuel R.; and Stewart, Lowell J., 4,567,565, Cl. 364-520.000.
Leiby, Robert W., 4,567,462, Cl. 340-347.00P.
Taylor, Bret K., 4,567,494, Cl. 346-140.00R.

Heynisch, Hinrich, to Siemens Aktiengesellschaft. High-gain Klystrontetrode. 4,567,406, Cl. 315-5.330.

Heynisch, Hinrich: *See—*
Glass, Erich; and Heynisch, Hinrich, 4,567,071, Cl. 428-35.000.

Hi-Speed Checkweigher Co., Inc.: *See—*
Lindstrom, John W., 4,566,584, Cl. 198-504.000.

Hickey, Christopher D. D., to Underwater Storage Limited. Underwater weapon systems. 4,566,367, Cl. 89-1.810.

Hiday, David R.; and Larsen, Charles G., to North American Philips Consumer Electronics Corp. Television receiver input circuit. 4,567,523, Cl. 358-191.100.

Higashiguchi, Teruaki: *See—*
Nakatani, Kaname; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; and Nakagama, Syoji, 4,566,908, Cl. 106-308.00N.

Higgins, J. Aiden; and Walton, Emory R., Jr., to Rockwell International Corporation. Process for making a probe for high speed integrated circuits. 4,566,184, Cl. 29-840.000.

Higuchi, Yoshiro: *See—*
Ito, Yasuro; and Higuchi, Yoshiro, 4,566,799, Cl. 366-1.000.

Hildebrand, Reinhard; and Waldmann, Bernd, to Siemens Aktiengesellschaft. Slider control. 4,566,399, Cl. 116-28.00R.

Hilti Aktiengesellschaft: *See—*
Herb, Armin, 4,566,610, Cl. 222-137.000.
Mirsberger, Helmut; and Popp, Franz, 4,566,832, Cl. 411-21.000.

Hinn, Hans: *See—*
Panoch, Hans J.; Feldmann, Rainer; Hinn, Hans; Brandt, Siegfried; and Haage, Hans-Jurgen, 4,566,931, Cl. 156-330.900.

Hirai, Yoshihisa; Shima, Masanori; and Aoki, Hirohiko, to Toa Harbor Works Co., Ltd. Method of hardening soft ground. 4,566,825, Cl. 405-267.000.

Hirakawa, Hiroyuki: *See—*
Arimoto, Satomi; Hirakawa, Hiroyuki; and Maekawa, Hiroshi, 4,567,538, Cl. 361-58.000.

Hirama, Masayuki: *See—*
Kumano, Masafumi; Kawashima, Ikue; Hirama, Masayuki; and Tsuji, Yasuhiro, 4,566,453, Cl. 128-303.100.

Hirano, Hiroyuki: *See—*
Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,566,354, Cl. 74-866.000.

Hiraoka, Masaaki: *See—*
Kotone, Yoshiharu; and Hiraoka, Masaaki, 4,566,675, Cl. 254-360.000.

Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, to Eisai Co., Ltd. Carboximide derivative and medicines containing same. 4,567,180, Cl. 514-253.000.

Hirose, Syunichi, to Kabushiki Kaisha Toshiba. Phase control device for a power converter. 4,567,552, Cl. 363-87.000.

Hirsch, Michael, to Energy Management Corporation. Irrigation control system. 4,567,563, Cl. 364-420.000.

Hisano, Katsukuni: *See*—
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, 4,566,810, Cl. 384-280.000.

Hisatake, Masayuki: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; Hisatake, Masayuki; and Ohmori, Takashi, 4,567,488, Cl. 346-76.0PH.

Hitachi Denshi Engineering Kabushiki Kaisha: *See*—
Kawano, Hikaru; and Sato, Koji, 4,566,244, Cl. 53-588.000.

Hitachi Engineering Co., Ltd.: *See*—
Enomoto, Masaki; and Ozawa, Michihiro, 4,567,018, Cl. 376-435.000.

Hitachi, Ltd.: *See*—
Enomoto, Masaki; and Ozawa, Michihiro, 4,567,018, Cl. 376-435.000.
Iizuka, Kenichi; Uzuhashi, Hideo; Uneyama, Yoshihisa; Matuda, Michiya; and Kobayashi, Minoru, 4,566,289, Cl. 62-228.400.
Ishitani, Tohru; Tamura, Hifumi; and Shimase, Akira, 4,567,398, Cl. 313-362.100.
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, 4,566,843, Cl. 414-680.000.
Koyama, Hiroshi; and Saito, Keiji, 4,566,299, Cl. 72-8.000.
Miyagi, Masahiro; Uehara, Katsuharu; Nozawa, Yoshio; and Deguchi, Takahiko, 4,566,359, Cl. 83-23.000.
Miyauchi, Tateoki; Hongo, Mikio; Mizukoshi, Katsuro; Yamaguchi, Hiroshi; and Shimase, Akira, 4,566,765, Cl. 350-619.000.
Nogami, Tadahiko; and Nishino, Tadashi, 4,566,954, Cl. 204-28.000.
Sakamoto, Masahide; and Shida, Masami, 4,566,420, Cl. 123-489.000.
Takemoto, Akinobu; Takeichi, Kenzo; Yabe, Yuhiko; and Yoshikawa, Yoshiaki, 4,567,418, Cl. 318-685.000.
Tohyama, Shigeo, 4,566,793, Cl. 356-319.000.
Umemura, Shinichiro; Katakura, Kageyoshi; and Ogawa, Toshio, 4,566,459, Cl. 128-660.000.
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, 4,566,810, Cl. 384-280.000.

Hitachi Metals, Ltd.: *See*—
Sasaki, Yoshitaka, 4,566,778, Cl. 355-3.0FU.

Hiyama, Tamejiro: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.

Hobo, Nobuhito: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.

Hobson Bros., Inc.: *See*—
Hobson, Ervin J., 4,566,746, Cl. 339-60.00R.

Hobson, Ervin J., to Hobson Bros., Inc. Electrical connector. 4,566,746, Cl. 339-60.00R.

Hocking, Martin B.: *See*—
O'Brien, Robert N.; McOrmond, Philip M.; Hocking, Martin B.; and Thornton, Kenneth R., 4,566,315, Cl. 73-61.400.

Hockley, Peter J.; and Thwaites, Michael J., to British Petroleum Company p.l.c., The. Memory device. 4,567,499, Cl. 357-2.000.

Hoechst Aktiengesellschaft: *See*—
Engelmann, Axel, 4,566,999, Cl. 260-392.000.
Mohr, Dieter, 4,566,959, Cl. 204-129.750.
Mohr, Dieter, 4,566,960, Cl. 204-129.750.
Moroni, Wilko, 4,567,125, Cl. 430-58.000.
Pliefke, Engelbert, 4,566,958, Cl. 204-129.750.
Schwierz, Peter P.; Rebhan, Adolf; and Moraw, Roland, 4,566,783, Cl. 355-14.0FU.
Sprintschnik, Gerhard; Niderstatter, Walter; and Stroszynski, Joachim, 4,566,952, Cl. 204-27.000.
Voelskow, Hartmut; and Schlingmann, Merten, 4,567,140, Cl. 435-42.000.

Hoffeins, Hans; Kalbfuss, Richard; and Ipek, Bora, to BBC Aktiengesellschaft Brown, Boveri & Cie. Multifuel burner. 4,566,268, Cl. 60-39.463.

Hoffman, Lawrence A.; Hacker, Jay P.; and Miller, William M., to International Harvester Company. Hood tilt retardation system. 4,566,552, Cl. 180-69.210.

Hoffman, Theodor: *See*—
Simonovitch, Chaim; Hoffman, Theodor; and Sasson, Sabar, 4,566,995, Cl. 260-239.30B.

Hoffman, William F.: *See*—
Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., 4,567,289, Cl. 560-059.000.

Hoffmann, Harald; Henrich, Gunter; and Waldhecker, Heinz-Dieter, to Klockner-Humboldt-Deutz AG. Filter for cleaning gases. 4,566,882, Cl. 55-100.000.

Hoffmeister, Lawrence D., to United States of America, Army. Composite tankage arrangement for liquid fuel expulsion. 4,566,609, Cl. 222-130.000.

Hofmeister, Helmut; Laurent, Henry; Annen, Klaus; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 17-haloethynyl steroids, and novel 17-haloethynyl steroids. 4,567,002, Cl. 260-397.400.

Hogen, Mark L.: *See*—
Hubbard, E. Daniel; Harvey, Richard D.; and Hogen, Mark L., 4,566,910, Cl. 127-70.000.

Hohmann, Hans: *See*—
Klein, Hans-Christof; and Hohmann, Hans, 4,566,805, Cl. 374-16.000.

Hojo, Yoshikata: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,566,897, Cl. 71-88.000.

Holland Hitch Company: *See*—
Buckley, John T., 4,566,715, Cl. 280-434.000.

Hollaus, Reinhard; Zehetbauer, Rudolf; and Bednorz, Klaus, to Siemens Aktiengesellschaft. Solar cell module. 4,567,316, Cl. 136-246.000.

Hollingsworth GmbH: *See*—
Frosch, Werner, 4,566,153, Cl. 19-98.000.

Hollis Automation, Inc.: *See*—
Comerford, Matthias, 4,566,624, Cl. 228-180.100.

Holmes, Billy G., to Mobil Oil Corporation. Method for operating an injection well in an in-situ combustion oil recovery using oxygen. 4,566,536, Cl. 166-251.000.

Holz, Emil; and Hutzler, Hagen, to Hermann Finckh Maschinenfabrik GmbH & Co. Method of and apparatus for treating waste paper. 4,566,942, Cl. 162-4.000.

Holzle, Gerd; Miotto, Mirella; Reinert, Gerhard; and Polony, Rudolf, to Ciba-Geigy Corporation. Water-soluble zinc and aluminium phthalocyanines and use thereof as photoactivators. 4,566,874, Cl. 8-103.000.

Homeyer, Bernhard: *See*—
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,567,168, Cl. 514-89.000.

Hon, David T., to Hon Folder Development Ltd. Folding bicycle with releasable brace assembly. 4,566,713, Cl. 280-287.000.

Hon Folder Development Ltd.: *See*—
Hon, David T., 4,566,713, Cl. 280-287.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ban, Keisuke; and Ohashi, Yasuo, 4,566,519, Cl. 164-97.000.
Furukawa, Yoshimi; and Sano, Shoichi, 4,566,710, Cl. 280-91.000.
Koizumi, Yusuke; Furukawa, Yoshimi; and Sano, Shoichi, 4,566,711, Cl. 280-91.000.
Sano, Shoichi, 4,566,709, Cl. 280-91.000.
Tsuboi, Masaharu, 4,566,577, Cl. 192-85.0CA.

Honda, Haruhisa; Onoda, Shigeyoshi; and Nishino, Fumio, to Canon Kabushiki Kaisha. Process kit for image forming apparatus. 4,566,777, Cl. 355-3.00R.

Honda, Kazuhiko: *See*—
Kusakabe, Tetsuo; Sakai, Tetsuro; and Honda, Kazuhiko, 4,567,507, Cl. 358-11.000.

Honda, Keisuke: *See*—
Chubachi, Noriyoshi; Kushibiki, Junichi; and Nakanishi, Kouichi, 4,566,333, Cl. 73-642.000.

Honda, Takenobu: *See*—
Suzuki, Katsuhiko; and Honda, Takenobu, 4,566,562, Cl. 187-22.000.

Hone, Norbert; Horwege, Claus; and Rosenkranz, Otto, to Krupp Corpoplast Maschinenbau GmbH. Apparatus for making a parison for blowmolding of a hollow article. 4,566,871, Cl. 425-525.000.

Honegger, Heinz; and Ganz, Josef, to Honel Holding AG. Bridging system for expansion gaps. 4,566,143, Cl. 14-16.500.

Honekman, Robert D.; and Fisher, Curt, to Honekman, Robert D. Electronic dart game scoreboard. 4,567,461, Cl. 340-323.00R.

Honel Holding AG: *See*—
Honegger, Heinz; and Ganz, Josef, 4,566,143, Cl. 14-16.500.

Honeywell, Inc.: *See*—
Bohrer, Philip J., 4,566,320, Cl. 73-204.000.
Bozarth, Theodore B.; Demark, Anthony M.; Finn, Edward F.; and Lynch, Frank, 4,567,466, Cl. 340-347.0AD.
Hanse, Joel G., 4,566,794, Cl. 356-350.000.

Honeywell Information Systems Inc.: *See*—
Bashaw, Lawrence D., 4,567,593, Cl. 371-25.000.
Moffett, Richard C., 4,567,571, Cl. 364-900.000.

Hongo, Mikio: *See*—
Miyauchi, Tateoki; Hongo, Mikio; Mizukoshi, Katsuro; Yamaguchi, Hiroshi; and Shimase, Akira, 4,566,765, Cl. 350-619.000.

Hoover, Lonnie D.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,566,976, Cl. 252-8.50A.

Hopkins, Maxwell M.; and Miller, Arthur, to RCA Corporation. Method for fabricating a glass CRT panel. 4,566,893, Cl. 65-69.000.

Hoppin, Charles R.: *See*—
Tovrog, Benjamin S.; Hoppin, Charles R.; and Johnson, Bryce V., 4,567,155, Cl. 502-123.000.

Horgen, Floyd D. Golf club swing training method. 4,566,696, Cl. 273-193.00A.

Horn, Hans C.: *See*—
Grimmer, Johannes; and Horn, Hans C., 4,567,262, Cl. 544-251.000.

Hornbeck, Larry J., to Texas Instruments Incorporated. Spatial light modulator and method. 4,566,935, Cl. 156-626.000.

Horner, Peter: *See*—
Smuda, Siegfried; Horner, Peter; Kogel, Karl; and Zeitler, Peter, 4,566,673, Cl. 254-84.000.

Horodysky, Andrew G., to Mobil Oil Company. Fuels containing sulfurized organic acid diamine salts. 4,566,879, Cl. 44-71.000.

Horvath, Lorand: *See*—
Kaffka, Karoly; Nadai, Bela; Czabaffy, Andras; and Horvath, Lorand, 4,566,797, Cl. 356-402.000.

Horwege, Claus: *See—*
Hone, Norbert; Horwege, Claus; and Rosenkranz, Otto, 4,566,871, Cl. 425-525.000.
Hoshi, Akira: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Takahashi, Yoshimi; Hoshi, Akira; and Mizutani, Uichiro, 4,566,323, Cl. 73-295.000.
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, to Mitsubishi Denki K.K. Circuit interrupter. 4,567,455, Cl. 335-16.000.
Hosono, Akira: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,566,897, Cl. 71-88.000.
Hospital Therapy Products, Inc.: *See—*
Roberts, Timothy J.; Roberts, Thomas J., Jr.; Roberts, Thomas J., Sr.; and Marinier, Robert P., Jr., 4,566,142, Cl. 4-604.000.
Hostler, Jonathan E.; and Beaver, Richard P., to PPG Industries, Inc. Self purging fin cooler. 4,566,890, Cl. 65-12.000.
House, Roy F.; and Hoover, Lonnie D., to NL Industries, Inc. Viscous heavy brines. 4,566,976, Cl. 252-8.50A.
Howell, William J.; and Hatchett, John D., to Motorola, Inc. FSK Modulator and method for NRZ data transmission utilizing PLL frequency synthesis. 4,567,603, Cl. 375-65.000.
Howells, Richard D., to Minnesota Mining and Manufacturing Company. Fluorochemicals and fibrous substrates treated therewith: compositions of cationic and non-ionic fluorochemicals. 4,566,981, Cl. 252-8.800.
HRI, Inc.: *See—*
Faber, Marcel; Bernstein, Jerome D.; and Grossman, Matthew, 4,567,145, Cl. 435-161.000.
Hsieh, Harry W. S.: *See—*
Rizk, Sidky D.; Hsieh, Harry W. S.; and Mazzeo, Michael P., 4,567,107, Cl. 428-425.500.
Hubbard, E. Daniel; Harvey, Richard D.; and Hogen, Mark L., to Grain Processing Corporation. Starch phosphates and amphoteric starch phosphates. 4,566,910, Cl. 127-70.000.
Hubbard, Lincoln W. Dual oscillator method for detecting flaws in a moving chain. 4,567,437, Cl. 324-237.000.
Huber, Johann; and Lorenz, Lutz, to Uhde GmbH. Pipe joint construction for remotely controlled connection and disconnection. 4,566,722, Cl. 285-18.000.
Hubner, Erich: *See—*
Becker, Franz-Josef; Hubner, Erich; and Lammerich, Walter, 4,567,098, Cl. 428-327.000.
Hudson Oxygen Therapy Sales Co.: *See—*
Havstad, Harold R., 4,566,441, Cl. 128-40.000.
Huebner, David J.; and Saam, John C., to Dow Corning Corporation. Emulsions of reinforced polydiorganosiloxane latex. 4,567,231, Cl. 524-837.000.
Huggins, Thomas B.: *See—*
Raymond, Theodore E.; Huggins, Thomas B.; and Vining, George E., 4,566,835, Cl. 414-53.000.
Hughes Aircraft Company: *See—*
Lim, Hong S., 4,567,119, Cl. 429-59.000.
Hughes, H. Mervin, II: *See—*
Kramer, Robert W., 4,566,455, Cl. 128-380.000.
Hughes Tool Company - USA: *See—*
Sullivan, Eric C.; and Allford, Daniel W., 4,567,343, Cl. 219-74.000.
Huinink, Heinrich: *See—*
Mauk, Gerhard; and Huinink, Heinrich, 4,566,514, Cl. 152-209.00R.
Hulyer, Michael G., to U.S. Philips Corporation. Two-channel compatible television transmission system for wide picture formats. 4,567,508, Cl. 358-11.000.
Humes, Dennis W.: *See—*
Leopold, Wilbur R., Jr.; and Humes, Dennis W., 4,566,481, Cl. 137-296.000.
Hunnicutt, Wayne E.: *See—*
Arthur, Gregory L.; and Hunnicutt, Wayne E., 4,566,717, Cl. 280-701.000.
Husson, Alan L.: *See—*
Polis, Marjorie J.; and Husson, Alan L., 4,567,560, Cl. 364-184.000.
Huston, Roy E., Jr. Chord playing attachment for stringed musical instruments. 4,566,365, Cl. 84-317.000.
Hutton, Denis A.; and Millar, Malcolm H., to Interox Chemicals Limited. Granulation. 4,567,010, Cl. 264-117.000.
Huttunen, Jouko: *See—*
Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, 4,567,255, Cl. 536-30.000.
Hutzler, Hagen: *See—*
Holz, Emil; and Hutzler, Hagen, 4,566,942, Cl. 162-4.000.
Hwang, Edward F.: *See—*
Okamoto, Yoshiyuki; and Hwang, Edward F., 4,567,298, Cl. 564-215.000.
Hwang, Yu-Tang: *See—*
Pullukat, Thomas J.; Hwang, Yu-Tang; and Dombro, Robert A., 4,567,243, Cl. 526-128.000.
Hydril Company: *See—*
Roche, Joseph R., 4,566,494, Cl. 137-872.000.
Hygolet AG: *See—*
Hefty, Dipl.-Ing. B.; and Hefty, Arpad, 4,566,648, Cl. 242-67.30R.
Hyman International Limited: *See—*
Griffiths, Anthony C. M., 4,567,008, Cl. 264-40.500.
Hyman, Richard M. Air baffled hairbrush. 4,566,473, Cl. 132-120.000.
Hynes, Thomas G.: *See—*
Jelsma, Richard K.; Choi, Charles H.; and Hynes, Thomas G., 4,566,445, Cl. 128-70.000.
Ibau Barcelona, S.A.: *See—*
Klein-Albenhausen, Heinrich, 4,566,232, Cl. 52-195.000.
Ichida, Nobuyuki: *See—*
Sato, Takuso; Ichida, Nobuyuki; and Miwa, Hirohide, 4,566,460, Cl. 128-660.000.
Ichikawa, Yoshiaki: *See—*
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, 4,566,843, Cl. 414-680.000.
Ichikawa, Yoshimitu: *See—*
Watanabe, Hideyuki; and Ichikawa, Yoshimitu, 4,566,252, Cl. 53-410.000.
Ihm, Werner: *See—*
Muller, Jurgen; and Ihm, Werner, 4,566,682, Cl. 271-90.000.
Iijima, Katsumi: *See—*
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, 4,566,810, Cl. 384-280.000.
Iizuka, Akira: *See—*
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Yamauchi, Takashi; and Iizuka, Akira, 4,567,293, Cl. 562-496.000.
Iizuka, Kenichi; Uzuhashi, Hideo; Uneyama, Yoshihisa; Matuda, Michiya; and Kobayashi, Minoru, to Hitachi, Ltd. Refrigerator control system. 4,566,289, Cl. 62-228.400.
Iizuka, Kiyoshi: *See—*
Ohtaka, Keiji; Suzuki, Takashi; Iizuka, Kiyoshi; and Mizutani, Hidemasa, 4,567,123, Cl. 430-4.000.
Ikari Corporation: *See—*
Kurosawa, Toshishige; Ishisaka, Satoru; Yasutomi, Kazuki; and Ishiwatari, Takanobu, 4,566,218, Cl. 43-58.000.
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,567,493, Cl. 346-140.00R.
Ikeda, Masayuki, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Variable frequency oscillator. 4,567,448, Cl. 331-25.000.
Ikeda, Teruyuki: *See—*
Shimada, Yuzo; Utsumi, Kazuaki; Ikeda, Teruyuki; and Suzuki, Masanori, 4,567,542, Cl. 361-321.000.
Ikuma, Sadao: *See—*
Tomono, Hiromi; Kokubo, Takashi; Yamaguchi, Kazuki; and Ikuma, Sadao, 4,567,233, Cl. 525-71.000.
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, to NGK Insulators, Ltd. Process for producing an age-hardening copper titanium alloy strip. 4,566,915, Cl. 148-11.50C.
Ilardo, Charles S., to Occidental Chemical Corporation. Flame retardant polyolefin compositions. 4,567,214, Cl. 523-216.000.
Imamura, Haruo: *See—*
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.
Imangazieva, Gulsara K.: *See—*
Ljubman, Nazar Y.; Imangazieva, Gulsara K.; Nugmanova, Lyalya T.; Uskov, Alexandr I.; Sydykova, Tokhtobubu C.; and Kim, Zinaida I., 4,567,207, Cl. 521-35.000.
Imperial Chemical Industries PLC: *See—*
Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, 4,567,278, Cl. 548-309.000.
Brewster, Andrew G.; and Caulkett, Peter W. R., 4,567,197, Cl. 514-452.000.
Crowley, Patrick J., 4,567,199, Cl. 514-531.000.
Edwards, Philip N.; and Large, Michael S., 4,567,174, Cl. 514-210.000.
Imsand, Donald J. Three dimensional television system. 4,567,513, Cl. 358-92.000.
Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for dividing the elements of a Galois field. 4,567,568, Cl. 364-761.000.
Index Industries, Inc.: *See—*
Englund, Richard L., 4,567,458, Cl. 337-365.000.
Indianapolis Center for Advanced Research: *See—*
Schroeder, Eugene, 4,566,331, Cl. 73-632.000.
Industra Products, Inc.: *See—*
Witwer, Keith A.; and Walker, Robert G., 4,566,180, Cl. 29-596.000.
Industrie Zanussi S.p.A.: *See—*
Piai, Dino; Rigoni, Renzo; and Paruzzolo, Giovanni, 4,566,970, Cl. 210-409.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Coli, Giuseppe; and Rattin, Luciano, 4,566,779, Cl. 355-3.00R.
Ing. Erich Pfeiffer GmbH & Co., Firms: *See—*
Sukopp, Hans, 4,566,611, Cl. 222-153.000.
Ingersoll Cutting Tool Company: *See—*
Neumueller, Ronald L., 4,566,827, Cl. 407-42.000.
Inoue, Akihisa: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Takahashi, Yoshimi; Hoshi, Akira; and Mizutani, Uichiro, 4,566,323, Cl. 73-295.000.
Inoue, Akira, to Olympus Optical Co., Ltd. Power supply unit for electronic flash. 4,566,769, Cl. 354-145.100.
Inoue, Seijiro; and Ota, Shigenori, to Kyowa Hakko Kogyo Co., Ltd. Bread or other cereal-based food improver composition involving the addition of phospholipase A to the flour. 4,567,046, Cl. 426-20.000.
Institut de Recherches de la Siderurgie Francaise: *See—*
Pazdej, Richard; and Pavinsto, Albert, 4,566,877, Cl. 44-51.000.
Institut Dr. Friedrich Forster: *See—*
Dreher, Ulrich; and Reitz, Helmut, 4,566,585, Cl. 198-624.000.

Instone, Giles A.; and Instone, Jeremy A., to Solindo Equipment Leasing Ltd. Animal conveyance capable of conversion into an air freight container. 4,566,404, Cl. 119-8.000.
Instone, Jeremy A · *See*—
Instone, Giles A.; and Instone, Jeremy A., 4,566,404, Cl. 119-8.000.
Intech Systems, Inc.: *See*—
Binning, Ronald L.; and Sieder, Burton C., 4,566,838, Cl. 414-278.000.
Interatom Internationale Atomreaktorbau GmbH: *See*—
Thissen, Klaus; and Barzantny, Joachim, 4,566,859, Cl. 417-50.000.
Interco Incorporated: *See*—
Sitzes, Fred B., 4,566,197, Cl. 36-011.000.
International Business Machines Corporation: *See*—
Afzali-Ardakani, Ali; Cohen, Mitchell S.; Pennington, Keith S.; and Sachdev, Krishna G., 4,567,490, Cl. 346-135.100.
Bederman, Seymour, 4,567,590, Cl. 370-86.000.
Brodsky, Marc H.; and Weinberg, Zeev A., 4,566,913, Cl. 148-1.500.
Fredericks, Edward C.; Greenhaus, Herbert L.; Nanda, Madan M.; and Via, Giorgio G., 4,567,132, Cl. 430-312.000.
Gossler, Werner; Strube, Anneliese; and Zurheide, Manfred, 4,566,173, Cl. 29-571.000.
Raver, Norman, 4,567,378, Cl. 307-270.000.
Saade , Henry Y.; and Tindall, William N. J., 4,567,574, Cl. 364-900.000.
Siegel, Paul H.; and Todd, Stephen J., 4,567,464, Cl. 340-347.0DD.
Wyatt, Virgil D.; Kraft, Wayne R.; and Thoma, Nandor G., 4,567,561, Cl. 364-200.000.
International Harvester Company: *See*—
Hoffman, Lawrence A.; Hacker, Jay P.; and Miller, William M., 4,566,552, Cl. 180-69.210.
International Minerals & Chemical Corp.: *See*—
Sundelin, Kurt G. R., 4,567,173, Cl. 514-188.000.
International Standard Electric Corporation: *See*—
Greenwood, John C., 4,567,451, Cl. 331-155.000.
Szabo, Laszlo; and Schunemann, Klaus, 4,567,450, Cl. 331-107.0DP.
Zebisch, Manfred W., 4,567,376, Cl. 307-106.000.
International Telephone and Telegraph Corporation: *See*—
Vensko, George; Carlin, Lawrence; Potter, John; and Smith, Allen R., 4,567,606, Cl. 381-43.000.
InterNorth, Inc.: *See*—
Lisowyj, Bohdan, 4,567,026, Cl. 423-81.000.
Interox Chemicals Limited: *See*—
Hutton, Denis A.; and Millar, Malcolm H., 4,567,010, Cl. 264-117.000.
Inui, Toshiharu: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; Hisatake, Masayuki; and Ohmori, Takashi, 4,567,488, Cl. 346-76.0PH.
Ipek, Bora: *See*—
Hoffeins, Hans; Kalbfuss, Richard; and Ipek, Bora, 4,566,268, Cl. 60-39.463.
IRECO Incorporated: *See*—
Jessop, Harvey A., 4,566,919, Cl. 149-20.000.
Irmen, Wolfgang, to W. Schlafhorst & Co. Pneumatic yarn splicing device. 4,566,260, Cl. 57-22.000.
Irvin Industries, Inc.: *See*—
Gavagan, James A.; and Brennan, William E., 4,566,160, Cl. 24-637.000.
Petersen, Carl M., III, 4,566,649, Cl. 242-107.40A.
Irvine, Robert; Roetter, Frank T.; and Stearns, Willis R., to Pitney Bowes Inc. Document feeding device. 4,566,685, Cl. 271-150.000.
Irvine, Stuart J. C.; Mullin, John B.; and Giess, Jean, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Utilizing interdiffusion of sequentially deposited links of HgTe and CdTe. 4,566,918, Cl. 148-175.000.
Isaksson, Stig A. Reciprocating blade cutting device. 4,566,190, Cl. 30-373.000.
Isbrandt, Russell R.; and Young, Chung I., to Minnesota Mining and Manufacturing Company. Film for thermal imaging. 4,567,133, Cl. 430-348.000.
Ishiguro, Ken: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, 4,567,114, Cl. 428-480.000.
Ishihara, Takao, to Mitsubishi Jukogyo Kabushiki Kaisha. Slag tap combustion apparatus. 4,566,392, Cl. 110-165.00R.
Ishihara, Toshiaki: *See*—
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, 4,566,915, Cl. 148-11.50C.
Ishii, Munenori, to Mitutoyo Mfg. Co., Ltd. Digital indicating type dimension measuring instrument. 4,566,201, Cl. 33-172.00E.
Ishii, Satoshi: *See*—
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.
Ishikawa, Toshio: *See*—
Yamamoto, Yosizi; and Ishikawa, Toshio, 4,566,864, Cl. 417-353.000.
Ishioka, Ryoji: *See*—
Nagato, Nobuyuki; Maki, Kenichiro; Uematsu, Tomoe; and Ishioka, Ryoji, 4,567,292, Cl. 560-245.000.
Ishisaka, Satoru: *See*—
Kurosawa, Toshishige; Ishisaka, Satoru; Yasutomi, Kazuki; and Ishiwatari, Takanobu, 4,566,218, Cl. 43-58.000.
Ishitani, Tohru; Tamura, Hifumi; and Shimase, Akira, to Hitachi, Ltd. Liquid metal ion source. 4,567,398, Cl. 313-362.100.
Ishiwatari, Takanobu: *See*—
Kurosawa, Toshishige; Ishisaka, Satoru; Yasutomi, Kazuki; and Ishiwatari, Takanobu, 4,566,218, Cl. 43-58.000.
Ishizuka, Akio; Yamazaki, Hisashi; and Yamazaki, Kikuo, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,567,371, Cl. 250-483.100.
Isover Saint-Gobain: *See*—
Degenne, Michel, 4,567,365, Cl. 250-338.000.
Israel, Renato: *See*—
Bailly, Francois P.; Bourgoin, Alain; and Israel, Renato, 4,567,329, Cl. 179-18.0FA.
Itatani, Hiroshi; Kashima, Mikito; and Tasaki, Yasutaka, to UBE Industries, Ltd. Process for producing iodo-aromatic compounds. 4,567,280, Cl. 549-43.000.
Ito, Giichi; Nakano, Ichizo; Shimizu, Yuichi; Mukai, Kosaku; and Suzuki, Saiju, to NTT Gijutsu Iten Kabushiki Kaisha. Measurement head for welding machines. 4,567,347, Cl. 219-124.340.
Ito, Hiroshi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,566,348, Cl. 74-359.000.
Ito, Isao: *See*—
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.
Ito, Shingo: *See*—
Shimada, Kenjiro; Otomo, Masao; Tomita, Fusao; and Ito, Shingo, 4,567,164, Cl. 514-33.000.
Ito, Takeshi: *See*—
Yashiro, Yoshinobu; and Ito, Takeshi, 4,566,409, Cl. 123-65.0PE.
Ito, Yasuro; and Higuchi, Yoshiro, to Ito, Yasuro; and Taisei Corporation. Apparatus for adjusting the quantity of liquid deposited on fine granular materials and method of preparing mortar or concrete. 4,566,799, Cl. 366-1.000.
Itoh, Hisao: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, 4,567,374, Cl. 250-578.000.
Itoh, Yoshio: *See*—
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, 4,566,915, Cl. 148-11.50C.
Itsumi, Manabu; Ehara, Kohei; Muramoto, Susumu; and Matsuo, Seitaro, to Nippon Telegraph and Telephone Public Corporation. Manufacturing process for semiconductor integrated circuits. 4,566,940, Cl. 156-643.000.
ITT Corporation: *See*—
Martin, Philip T., 4,567,331, Cl. 179-170.0NC.
ITT Industries, Inc.: *See*—
Birkenbach, Alfred, 4,566,277, Cl. 60-587.000.
Kahrs, Manfred, 4,566,870, Cl. 418-30.000.
Klein, Hans-Christof; and Hohmann, Hans, 4,566,805, Cl. 374-16.000.
Iwai, Tomio; and Torigai, Katsumi, to Sanshin Kogyo Kabushiki Kaisha. Speed controller for marine propulsion device. 4,566,415, Cl. 123-361.000.
Iwamoto, Shoji; and Kubota, Kazuo, to Fuji Photo Film Co., Ltd. Decorative winding method for magnetic tape or the like. 4,566,647, Cl. 242-67.10R.
Iwamoto, Yogaku: *See*—
Kadotani, Kanichi; and Iwamoto, Yogaku, 4,566,435, Cl. 126-443.000.
Iwasaki Electric Co., Ltd.: *See*—
Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, 4,567,403, Cl. 315-47.000.
Iwasaki, Masahiro: *See*—
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.
Iwatani & Co., Ltd.: *See*—
Kotani, Masutoshi, 4,566,543, Cl. 172-4.000.
Iwatsu Electric Co., Ltd.: *See*—
Komiya, Koji, 4,567,465, Cl. 340-347.0AD.
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, to Hitachi, Ltd. Multiarticulated manipulator. 4,566,843, Cl. 414-680.000.
J-M Manufacturing Company, Inc.: *See*—
Menzel, Stanley W. O.; Mominee, David E.; and Vance, Gilbert W., 4,566,496, Cl. 138-154.000.
Jabarin, Saleh A., to Owens-Illinois, Inc. Multilayer containers with improved stress crack properties. 4,567,069, Cl. 428-35.000.
Jachimowicz, Felek: *See*—
Hansson, Per E. A.; and Jachimowicz, Felek, 4,566,943, Cl. 162-168.200.
Jacksier, Barry H., to AT&T Teletype Corporation. Biphase signal receiver. 4,567,604, Cl. 375-87.000.
Jackson, Fred L., to Manville Service Corporation. Product and process relating to hardboard. 4,567,215, Cl. 523-218.000.
Jackson, W. Shaun. Seat pack assembly. 4,566,617, Cl. 224-275.000.
James Hardie Industries Limited: *See*—
Musgrove, Neil R., 4,566,140, Cl. 4-324.000.
James River-Norwalk, Inc.: *See*—
Brown, Richard K., 4,567,341, Cl. 219-10.55E.
Jamison, William E. Four-wire telephone system with self-test means. 4,567,332, Cl. 179-175.000.
Janikowski, Daniel S.; and Shum, Ming S., to UOP Inc. Conductive pigment-coated surfaces. 4,567,111, Cl. 428-457.000.

Janopaul, Peter, Jr. Energy conserving concrete masonry unit, wall construction and method. 4,566,238, Cl. 52-407.000.
Janssen, Herbert F., to School of Medicine Texas Tech. Univ. Health Servcs. Ctr. Venous pressure measuring method and apparatus. 4,566,462, Cl. 128-677.000.
Janssen, Robert I., to Padco, Inc. Pressure fed paint roller. 4,566,816, Cl. 401-219.000.
Japan Styrene Paper Corporation: *See*—
Kuwabara, Hideki; and Sudo, Yoshimi, 4,567,208, Cl. 521-59.000.
Japan Tobacco & Salt Public Co., The: *See*—
Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, 4,566,471, Cl. 131-317.000.
Jarrett, Robert B.; Main, W. Eric; and Neidorff, Robert A., to Motorola, Inc. Clamp circuit. 4,567,388, Cl. 307-540.000.
Jarvinen, Philip O., to Massachusetts Institute of Technology. High-temperature brazed ceramic joints. 4,567,110, Cl. 428-433.000.
Jasper Corporation, The: *See*—
Frobose, James W., 4,566,735, Cl. 297-452.000.
Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert, 4,566,570, Cl. 192-56.00R.
Jeantet, Lucien: *See*—
Marechal, Roger; and Jeantet, Lucien, 4,566,427, Cl. 125-16.00R.
Jelsma, Richard K.; Choi, Charles H.; and Hynes, Thomas G. Stretcher for persons with spinal injuries. 4,566,445, Cl. 128-70.000.
Jeng, Chi-Cheng. Piston plunger. 4,566,139, Cl. 4-255.000.
Jenkins, Jerome D.; and Schultz, Neal G. Transfer roll with ceramic-fluorocarbon coating containing cylindrical ink holes with round, beveled entrances. 4,566,938, Cl. 156-643.000.
Jenny, Werner, to TBT Tiefbohrtechnik GmbH & Co. KG. Tool retainer having axially and radially movable clamping members. 4,566,705, Cl. 279-4.000.
Jerrim, John W., to Sangamo Weston, Inc. Synchronization system for use in direct sequence spread spectrum signal receiver. 4,567,588, Cl. 370-18.000.
Jeschek, Gerhard: *See*—
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.
Jessop, Harvey A., to IRECO Incorporated. Sensitized cast emulsion explosive composition. 4,566,919, Cl. 149-20.000.
Jidosha Kiki Co., Ltd.: *See*—
Yabe, Hideo; and Koike, Ichiro, 4,567,413, Cl. 318-489.000.
Jimerson, Bruce D.; and Nakasone, Henry H. Soft switch with positive on and off states. 4,567,375, Cl. 307-98.000.
John Fluke Mfg. Co., Inc.: *See*—
Blanchard, Randall D., 4,567,480, Cl. 340-712.000.
John, Reinmar: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,567,230, Cl. 524-786.000.
Johnsen & Jorgensen (Plastics) Limited: *See*—
Davis, Eugene E., 4,566,602, Cl. 215-256.000.
Johnson, Allan S., to Tapmatic Corporation. Tapping attachment and indexing mechanism therefor. 4,566,829, Cl. 408-239.00R.
Johnson, Bryce V.: *See*—
Tovrog, Benjamin S.; Hoppin, Charles R.; and Johnson, Bryce V., 4,567,155, Cl. 502-123.000.
Johnson, Earl R., to Loffland Brothers Company. Multiple biscuit clutch or brake with circulated immersion cooling. 4,566,579, Cl. 192-113.00B.
Johnson, Gilbert C.; and Landin, Heather V., to Minnesota Mining and Manufacturing Company. Ethylenically unsaturated polyesters. 4,567,237, Cl. 525-170.000.
Johnson, James R. Boot with expanding webs. 4,566,209, Cl. 36-116.000.
Johnson, John E.: *See*—
Seidentop, Alfred T.; and Johnson, John E., 4,566,693, Cl. 272-144.000.
Johnson, Leighton C., to Miles Laboratories, Inc. Apparatus and method useful for removing liquid from the outer surface of cylindrical pipette tube or the like. 4,566,203, Cl. 34-9.000.
Johnston, Andrew W. B.: *See*—
Brewin, Nicholas J.; and Johnston, Andrew W. B., 4,567,146, Cl. 435-172.300.
Johnston, James J., to Brand-Rex Company. Electrical connector receptacle. 4,566,749, Cl. 339-95.00D.
Johnston, Ronald J., to Aluma Systems, Incorporated. Clamp for shoring and scaffolding frames. 4,566,819, Cl. 403-385.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Two-step methane conversion process. 4,567,307, Cl. 585-330.000.
Jones, John E.; and Glenn, W. K., III, to Singer Company, The. Vacuum cleaner bag support. 4,566,884, Cl. 55-357.000.
Jones, Robert W., to Kliklok Corporation. Packaging system with interdigitating film advance. 4,566,253, Cl. 53-451.000.
Jorgensen, Pierre: *See*—
Diaz, Henri; Jorgensen, Pierre; and Vernet, Pierre, 4,566,961, Cl. 204-168.000.
Jorgensen, Ray B.; and Ackerman, Robert T., to Nicholson Manufacturing Company. Variable pneumatic pressure force-transmitting mechanism. 4,566,371, Cl. 92-92.000.
Jorne, Jacob; Roaysie, Emad; and Shah, Atul, to Energy Development Associates, Inc. Flow-through porous electrodes. 4,567,120, Cl. 429-72.000.
Joseph, Ady; Mayer, Lily; and Miutel, Alexander, to Metafuse Limited. Solutions for the fusion of one metal to another. 4,566,992, Cl. 252-518.000.
Joswick, Walter: *See*—
Scherer, George; Joswick, Walter; and Blonder, Isaac S., 4,567,516, Cl. 358-114.000.
Juei Jse, Lin. Multilayered corrugated roofing. 4,567,084, Cl. 428-150.000.
Juillerat, Michel R.: *See*—
Berger, Maurice; Bernasconi, Jean-Francois; and Juillerat, Michel R., 4,566,836, Cl. 414-57.000.
Jujo Paper Co., Ltd.: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, 4,567,114, Cl. 428-480.000.
Junkosha Co., Ltd.: *See*—
Harayama, Chiharu, 4,567,321, Cl. 174-117.00F.
Justice, Steve, to Williams, Clarence Orville. Insect trap. 4,566,220, Cl. 43-113.000.
K & H Distributors: *See*—
Herota, Rosh N., 4,566,356, Cl. 81-62.000.
Kabivitrum AB: *See*—
Lyons, Robert T., 4,567,045, Cl. 424-195.100.
Kabushiki Kaisha Daini Seikosha: *See*—
Maeda, Takashi; and Sato, Masayuki, 4,566,847, Cl. 414-744.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.
Baba, Kiyokazu; Shirao, Shojiro; Nishida, Kenji; and Kiyosawa, Hiroshi, 4,566,834, Cl. 414-27.000.
Kadotani, Kanichi; and Iwamoto, Yogaku, 4,566,435, Cl. 126-443.000.
Kabushiki Kaisha Meidensha: *See*—
Matsuse, Kohki; Hashimoto, Hitoshi; and Suzuki, Toshiaki, 4,567,555, Cl. 363-138.000.
Kabushiki Kaisha Naka Gijutsu Kenkyusho: *See*—
Naka, Hiromitsu, 4,566,233, Cl. 52-208.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Ikeda, Masayuki, 4,567,448, Cl. 331-25.000.
Kabushiki Kaisha Toshiba: *See*—
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,567,525, Cl. 358-213.000.
Hirose, Syunichi, 4,567,552, Cl. 363-87.000.
Kawakami, Hiroshi, 4,567,584, Cl. 369-38.000.
Nishitsuji, Kazuichi; Aikawa, Eiichi; and Haraguchi, Yukio, 4,566,865, Cl. 417-363.000.
Shimazaki, Takashi, 4,566,402, Cl. 118-653.000.
Yoshida, Yukimasa; and Watanabe, Tohru, 4,566,941, Cl. 156-643.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Goto, Kunifumi; Sugiura, Manabu; and Suzuki, Shinichi, 4,566,863, Cl. 417-295.000.
Miyazaki, Tsutomu; Fukuda, Tatemi; and Yoshimine, Kazuya, 4,566,263, Cl. 57-276.000.
Kadotani, Kanichi; and Iwamoto, Yogaku, to Kabushiki Kaisha Komatsu Seisakusho. Solar heat collecting apparatus. 4,566,435, Cl. 126-443.000.
Kaffka, Karoly; Nadai, Bela; Czabaffy, Andras; and Horvath, Lorand, to Kozponti Elelmiszeripari Kutato Intezet. Spectrophotometer operating at discrete wavelengths. 4,566,797, Cl. 356-402.000.
Kagota, Nobuhiro, to Mitsubishi Paper Mills, Ltd. Color-developing ink for non-carbon copying paper. 4,566,907, Cl. 106-21.000.
Kahrs, Manfred, to ITT Industries, Inc. Adjustable vane-type pump. 4,566,870, Cl. 418-30.000.
Kai, Yasuaki: *See*—
Tabata, Hiroshi; and Kai, Yasuaki, 4,567,082, Cl. 428-138.000.
Kaiser, Roman: *See*—
Lamparsky, Dietmar; and Kaiser, Roman, 4,567,291, Cl. 560-225.000.
Kaji, Hisatsugu: *See*—
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,567,086, Cl. 428-166.000.
Kajita, Hiroshi; and Nakajima, Tadanobu, to Mita Industrial Co., Ltd. Shell-type electrostatic copying apparatus. 4,566,780, Cl. 355-3.00R.
Kakuta, Hiroshi: *See*—
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.
Kalbfuss, Richard: *See*—
Hoffeins, Hans; Kalbfuss, Richard; and Ipek, Bora, 4,566,268, Cl. 60-39.463.
Kalk, Heinz: *See*—
Rau, Karl; Kalk, Heinz; and Metzger, Gerhard, 4,566,322, Cl. 73-295.000.
Kalkhof, Bernd; and Nagel, Karl, to Robert Bosch GmbH. Transistor-controlled-load, short-circuit-protected current-supply circuit. 4,567,537, Cl. 361-18.000.
Kamano, Yoshiaki; Sugai, Saburo; Okazaki, Tokuji; Yoshida, Seiichiro; and Akaboshi, Sanya, to Ohta Seiyaku Kabushiki Kaisha. 6α-Methylprednisolone derivatives. 4,567,172, Cl. 514-179.000.
Kamata, Tohru: *See*—
Noguchi, Shozo; Oshima, Yasunobu; and Kamata, Tohru, 4,567,598, Cl. 372-36.000.
Kanai, Seita; and Kanazawa, Hirotaka, to Mazda Motor Corporation. Suspension and steering control of motor vehicles. 4,566,718, Cl. 280-708.000.
Kanamori, Hiromitsu: *See*—
Hasegawa, Katsumi; and Kanamori, Hiromitsu, 4,566,643, Cl. 242-18.00R.

Kanazawa, Hirotaka: *See*—
Kanai, Seita; and Kanazawa, Hirotaka, 4,566,718, Cl. 280-708.000.
Kanebo Limited: *See*—
Tomita, Yogi; Yamamoto, Hisashi; and Kitagawa, Susumu, 4,566,911, Cl. 134-6.000.
Kaneda, Naoya, to Canon Kabushiki Kaisha. Focus detecting device. 4,566,773, Cl. 354-403.000.
Kaneko, Ryoichi: *See*—
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, 4,566,810, Cl. 384-280.000.
Kaneko, Takushi: *See*—
Vyas, Dolatrai M.; Kaneko, Takushi; and Doyle, Terrence W., 4,567,256, Cl. 544-58.200.
Kaneko, Yoshio: *See*—
Hara, Kunio; Tanaka, Toshie; Shibayama, Teruji; Morisaki, Minoru; and Kaneko, Yoshio, 4,566,924, Cl. 156-73.500.
Kano, Isao: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, 4,567,114, Cl. 428-480.000.
Kano, Masaaki; Yamaji, Hiroshi; Nakao, Shinji; and Okumura, Katsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for measuring dimension of secondary electron emission object. 4,567,364, Cl. 250-307.000.
Kao, Ming-Luh: *See*—
de la Guardia, Mario; and Kao, Ming-Luh, 4,567,521, Cl. 358-150.000.
Kapfhammer, Karl: *See*—
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, 4,567,459, Cl. 340-58.000.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Amino and substituted amino phosphinylalkanoyl compounds useful for treating hypertension. 4,567,166, Cl. 514-82.000.
Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Certain 3-phosphinyl-2-oxo-piperidine-1-acetic acid derivatives having anti-hypertensive activity. 4,567,167, Cl. 514-89.000.
Karass, Thomas J. Fibrous material reinforcing tape, method of making the same and containers reinforced by said tape. 4,567,070, Cl. 428-35.000.
Karlstad Vulk: *See*—
Skogman, Bengt G.; Svensson, Hans T.; and Torres, Eduardo E., 4,567,088, Cl. 428-213.000.
Karol, Thomas J.; and Sung, Rodney L., to Texaco Inc. Reaction product of Beta-mercaptoethanol and coconut oil as diesel fuel antiwear additive. 4,566,878, Cl. 44-57.000.
Kashima, Mikito: *See*—
Itatani, Hiroshi; Kashima, Mikito; and Tasaki, Yasutaka, 4,567,280, Cl. 549-43.000.
Kataczynski, Nachman, to Urdan Industries Ltd. Ammunition storage system and container for use therein. 4,566,588, Cl. 206-3.000.
Katakura, Kageyoshi: *See*—
Umemura, Shinichiro; Katakura, Kageyoshi; and Ogawa, Toshio, 4,566,459, Cl. 128-660.000.
Kataoka, Shigehiro; Nakamura, Takashi; Yamaji, Nobuyuki; and Nasuno, Seiichi, to Kikkoman Corporation. Method for preparing N^6,8-disubstituted 3',5'-cyclic adenosine monophosphate and salt thereof. 4,567,254, Cl. 536-27.000.
Kato, Kinya, to Nippon Kogaku K.K. Dual focus optical system. 4,566,762, Cl. 350-411.000.
Kato, Shuzo; and Feher, Kamilo, to Canadian Patents and Development Limited. Correlated signal processor. 4,567,602, Cl. 375-60.000.
Kato, Susumu: *See*—
Yoshida, Zenichi; Kato, Susumu; Amemiya, Yasuhiro; and Yanai, Keisuke, 4,567,308, Cl. 585-375.000.
Kato, Yuichi: *See*—
Miyamoto, Issei; and Kato, Yuichi, 4,566,350, Cl. 74-526.000.
Katoh, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument controlling a tone waveshape by key scaling. 4,566,364, Cl. 84-1.190.
Kawabata, Kazuo: *See*—
Sano, Takashi; Kawabata, Kazuo; and Miya, Yoji, 4,567,106, Cl. 428-413.000.
Kawagoe, Takashi: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,566,837, Cl. 414-222.000.
Kawaguchi, Yoichi: *See*—
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.
Kawai, Kazuhide: *See*—
Yoshida, Ryuichi; Suzuki, Shigeru; Koishikawa, Hirotoshi; Miyamoto, Yoshimi; and Kawai, Kazuhide, 4,566,751, Cl. 339-218.00S.
Kawakami, Hiroshi, to Kabushiki Kaisha Toshiba. Autochanger type disc player. 4,567,584, Cl. 369-38.000.
Kawakami, Kinya: *See*—
Misawa, Makoto; Mizoguchi, Tetsuya; Kawakami, Kinya; and Ahagon, Asahiro, 4,567,225, Cl. 524-526.000.
Kawakatsu, Akira: *See*—
Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, 4,566,471, Cl. 131-317.000.
Kawamura, Jun; and Fukano, Sakuzo, to Aikoh Co., Ltd. Method of heat retention in a blind riser. 4,566,518, Cl. 164-53.000.
Kawano, Hikaru; and Sato, Koji, to Musashi Engineering Kabushiki Kaisha; and Hitachi Denshi Engineering Kabushiki Kaisha. Paper sheet grip and transfer apparatus. 4,566,244, Cl. 53-588.000.
Kawase, Yoshihiro: *See*—
Yamada, Takeo; Yamamoto, Tomohisa; Ando, Seigo; and Kawase, Yoshihiro, 4,567,435, Cl. 324-207.000.
Kawashima, Hidetoshi: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.
Kawashima, Ikue: *See*—
Kumano, Masafumi; Kawashima, Ikue; Hirama, Masayuki; and Tsuji, Yasuhiro, 4,566,453, Cl. 128-303.100.
Kayser, John P.: *See*—
Elliott, Kirk W.; Garver, Christian J.; Kayser, John P.; and Dombroski, Robert M., 4,566,560, Cl. 184-15.100.
Keal, Charles, Jr., to Design & Manufacturing Corporation. Method of surface treatment of aluminum killed steel in preparation for porcelain coating. 4,567,067, Cl. 427-328.000.
Keenan, Charles E.; Mattern, Richard E.; and Vaccaro, Charles A., to Schulmerich Carillons, Inc. Handbell. 4,566,400, Cl. 116-171.000.
Keiper, Tilghman H., Jr., to Bethlehem Steel Corporation. Boltless, friction-fit, adjustable rail brace. 4,566,630, Cl. 238-292.000.
Keller, Paul. Automatic ice hopper. 4,566,286, Cl. 62-135.000.
Kelley, Robert G.: *See*—
Ruf, Walter; and Kelley, Robert G., 4,566,505, Cl. 141-83.000.
Kellogg, James A., to Lockheed Corporation. Wire-guide latching device for a wire-harness assembly form board. 4,566,502, Cl. 140-92.100.
Kemmner, Ulrich, to Robert Bosch GmbH. Aggregate for feeding of fuel to internal combustion engine particularly of power vehicle. 4,566,866, Cl. 417-366.000.
Kennecott Corporation: *See*—
Carpenter, James H., Jr., 4,566,230, Cl. 51-420.000.
Kenny, Andrew A.; Sokalski, Robert G.; Egle, Lawrence E.; and Stahly, Daniel C., to Eaton Corporation. Electronic feedback EGR valve. 4,566,423, Cl. 123-571.000.
Kensinger, Lex D.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.
Keppel, Robert A.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,567,158, Cl. 502-209.000.
Kesten, Arthur S., to United Technologies Corporation. Low-energy method for freeing chemically bound hydrogen. 4,567,033, Cl. 423-648.00R.
Key Pharmaceuticals, Inc.: *See*—
Sackner, Marvin A., 4,567,185, Cl. 514-282.000.
Kidani, Yoshinori; and Noji, Masahide, to Yoshinori Kidani. Complex compounds of platinum. 4,567,285, Cl. 556-137.000.
Kidd, Harry A.; and Edwards, Thomas R., to Dresser Industries, Inc. Automatic temperature compensated fuel flow regulation. 4,566,266, Cl. 60-39.060.
Kiehs, Karl: *See*—
Baumann, Annegrit; Kiehs, Karl; and Adolphi, Heinrich, 4,567,170, Cl. 514-128.000.
Kiesel Co., The: *See*—
Kleinholz, Edward O., 4,566,619, Cl. 227-8.000.
Kikkoman Corporation: *See*—
Kataoka, Shigehiro; Nakamura, Takashi; Yamaji, Nobuyuki; and Nasuno, Seiichi, 4,567,254, Cl. 536-27.000.
Kikuchi, Hideaki: *See*—
Tawara, Yoshio; Ohashi, Ken; and Kikuchi, Hideaki, 4,567,576, Cl. 365-2.000.
Kikuchi, Koichi: *See*—
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.
Kikuchi, Yoshiyuki: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.
Kikugawa, Shozo: *See*—
Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, 4,567,136, Cl. 435-4.000.
Kikumoto, Tadao, to Roland Corporation. Synchronizing signal generator. 4,566,362, Cl. 84-1.030.
Kim, Hyo-gun: *See*—
Sibilia, John P.; Kim, Hyo-gun; and Paterson, Arthur R., 4,566,991, Cl. 252-512.000.
Kim, Tae Y., to AT&T Technologies, Inc. Pulse plating of nickel-antimony films. 4,566,953, Cl. 204-28.000.
Kim, Zinaida I.: *See*—
Ljubman, Nazar Y.; Imangazieva, Gulsara K.; Nugmanova, Lyalya T.; Uskov, Alexandr I.; Sydykova, Tokhtobubu C.; and Kim, Zinaida I., 4,567,207, Cl. 521-35.000.
Kimball International, Inc.: *See*—
Henriott, Jay M., 4,566,743, Cl. 312-350.000.
Kimpel, Rolf-Dieter: *See*—
Schedele, Helmut; and Kimpel, Rolf-Dieter, 4,567,457, Cl. 335-128.000.
Kimura, Sosaku, to Citizen Watch Co., Ltd. System for correcting the position of a spindle for a processing machine. 4,566,226, Cl. 51-165.720.

Kincaid, Herbert: *See—*
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,566,167, Cl. 29-437.000.
Kingsbury, Charles M.: *See—*
Kulig, Constantine W.; Kingsbury, Charles M.; and Beckwith, Bruce R., 4,566,894, Cl. 65-304.000.
Kinjo, Hisao, to Victor Company of Japan, Ltd. Recording and/or reproducing apparatus. 4,567,535, Cl. 360-87.000.
Kinki Denki Co., Ltd.: *See—*
Tomita, Masao, 4,566,401, Cl. 116-207.000.
Kinnaer, Lucien: *See—*
Vandeplas, Paul; and Kinnaer, Lucien, 4,566,430, Cl. 126-433.000.
Kinoshita, Hiromitsu: *See—*
Nishibori, Setsuo; Komori, Hirohito; Saeki, Syuji; and Kinoshita, Hiromitsu, 4,567,242, Cl. 525-534.000.
Kinoshita, Mitsuo: *See—*
Nozawa, Ryoichiro; Kinoshita, Mitsuo; and Matsumura, Teruyuki, 4,567,342, Cl. 219-69.00M.
Kircher, Klaus: *See—*
Hammer, Heinz; Kircher, Klaus; and Meyer, Rolf-Volker, 4,567,210, Cl. 521-90.000.
Kiriake, Masaharu, to Murata Kikai Kabushiki Kaisha. System for supplying various kinds of cops to winder. 4,566,644, Cl. 242-35.50A.
Kirihara, Seishin: *See—*
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, 4,566,810, Cl. 384-280.000.
Kiselev, Evgeny I.: *See—*
Gorlov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., 4,566,587, Cl. 198-732.000.
Kishi, Fumio: *See—*
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.
Kiss, David B.: *See—*
Davidson, Marion A.; and Kiss, David B., 4,566,339, Cl. 73-862.390.
Kiss, Gabor D., to Celanese Corporation. Blend of wholly aromatic polyester and poly(ester-amide) capable of exhibiting an anisotropic melt phase. 4,567,227, Cl. 524-538.000.
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, to Mitsubishi Rayon Co., Ltd.; and Yamada Dobby Co., Ltd. Jacquard mechanism. 4,566,499, Cl. 139-59.000.
Kitagawa, Susumu: *See—*
Tomita, Yogi; Yamamoto, Hisashi; and Kitagawa, Susumu, 4,566,911, Cl. 134-6.000.
Kitagawa, Yoshiaki; Ohki, Koichiro; and Sarada, Toshio, to Matsushita Electric Works, Ltd. Electric space heater employing a vaporizable heat exchange fluid. 4,567,351, Cl. 219-341.000.
Kitahara, Takahiro: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,566,755, Cl. 350-96.340.
Kitamura, Masahiko: *See—*
Onogi, Toshiro; Yoda, Kenichi; and Kitamura, Masahiko, 4,567,556, Cl. 364-140.000.
Kitamura, Seiichi: *See—*
Sasaki, Masahiko; Watanabe, Kenji; and Kitamura, Seiichi, 4,566,398, Cl. 114-293.000.
Kitazawa, Noboru: *See—*
Matsumura, Wakuo; Kitazawa, Noboru; and Ohigashi, Yoshiaki, 4,566,250, Cl. 53-128.000.
Kitchens, John D.; and Novak, Leo R., to Dow Chemical Company, The. Modification of polymer surfaces. 4,567,241, Cl. 525-352.000.
Kivisto, Tuomo V. J.; Fallenius, Kai B.; and Niitti, Timo U., to Outokumpu Oy. Apparatus for leading off froth from the tank of a flotation cell. 4,566,968, Cl. 210-221.100.
Kiyosawa, Hiroshi: *See—*
Baba, Kiyokazu; Shirao, Shojiro; Nishida, Kenji; and Kiyosawa, Hiroshi, 4,566,834, Cl. 414-27.000.
Klaschka, Rudolf: *See—*
Wolf, Franz J.; and Klaschka, Rudolf, 4,566,604, Cl. 220-68.000.
Klein-Albenhausen, Heinrich, to Ibau Barcelona, S.A. Large volume silo for bulk material, particularly raw cement powder. 4,566,232, Cl. 52-195.000.
Klein, David, to Almet Hardware Limited. Deadlock mechanism. 4,566,725, Cl. 292-191.000.
Klein, Erwin, to Brown, Boveri & Cie AG. Cooling device, in which converters or rectifiers or other semiconductor components are immersed in boiling liquor. 4,566,529, Cl. 165-32.000.
Klein, Hans-Christof; and Hohmann, Hans, to ITT Industries, Inc. Device for determining and checking condition state and other parameters of a pressure fluid. 4,566,805, Cl. 374-16.000.
Klein, Max, to Crane & Co., Inc., a part interest. Rolling filter apparatus. 4,566,969, Cl. 210-387.000.
Kleindienst GmbH: *See—*
Bihler, Franz; and Abele, Anton, 4,566,706, Cl. 280-5.220.
Kleinholz, Edward O., to Kiesel Co., The. Pneumatic fastener-driving tool and method. 4,566,619, Cl. 227-8.000.
Klement, Ekkehard: *See—*
Schuoecker, Dieter; and Klement, Ekkehard, 4,567,355, Cl. 235-310.000.
Kliklok Corporation: *See—*
Cartwright, Willard E., 4,566,846, Cl. 414-742.000.
Jones, Robert W., 4,566,253, Cl. 53-451.000.
Kling, Thord. Dispenser for containing and dispensing a premoistened web of material. 4,566,606, Cl. 221-25.000.
Klingenstein, Walter: *See—*
Fink, Roland; and Klingenstein, Walter, 4,566,522, Cl. 164-316.000.
Klockner CRA Technologie GmbH: *See—*
von Bogdandy, Ludwig; and Brotzmann, Karl, 4,566,904, Cl. 75-38.000.
Klockner-Humboldt-Deutz AG: *See—*
Hoffmann, Harald; Henrich, Gunter; and Waldhecker, Heinz-Dieter, 4,566,882, Cl. 55-100.000.
Melcher, Gerhard; Megerle, Friedrich; and Wuth, Wolfgang, 4,566,903, Cl. 75-26.000.
Klopp, Gregory S.: *See—*
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.
Kluge, Arthur F.; Clark, Robin D.; Strosberg, Arthur M.; Pascal, Jean-Claude G.; and Whiting, Roger, to Syntex (U.S.A.) Inc. Cardioselective aryloxy- and arylthio- hydroxypropylene-piperazinyl acetanilides which affect calcium entry. 4,567,264, Cl. 544-400.000.
Klukos, Colette M. Decorative package. 4,566,592, Cl. 206-449.000.
Knabe, Martin; and Anzenhofer, Wolfgang, to Webasto-Werk W. Baier GmbH & Co. Sliding roof for vehicles. 4,566,730, Cl. 296-221.000.
Knapp, Caroline M.: *See—*
Knapp, Frank W.; and Knapp, Caroline M., 4,566,489, Cl. 137-614.000.
Knapp, Frank W.; and Knapp, Caroline M. Quick disconnect coupling apparatus. 4,566,489, Cl. 137-614.000.
Knight, Derek J.; and Sullivan, Gilbert, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Conformable fascine. 4,566,821, Cl. 404-35.000.
Knirck, Jeffrey G.: *See—*
Tucker, Hartwell F.; Tucker, Jeffrey R.; Ross, Dennis; and Knirck, Jeffrey G., 4,567,391, Cl. 310-156.000.
Knoblauch, Karl; Harder, Burkhard; Heimbach, Heinrich; and Cosentino, Charles F., to Bergwerksverband GmbH; and Nitrotec Corporation. Method and apparatus for inerting transport containers. 4,566,282, Cl. 62-48.000.
Knoblauch, Karl: *See—*
Richter, Ekkehard; Knoblauch, Karl; Schlegel, Rolf; and Korbacher, Werner, 4,566,881, Cl. 55-25.000.
Knorr, Andreas: *See—*
Niemers, Ekkehard; Knorr, Andreas; and Garthoff, Bernward, 4,567,188, Cl. 514-332.000.
Knothe, Erich: *See—*
Sodler, Walter; Knothe, Erich; Maaz, Gunther; and Madge, Joachim, 4,566,548, Cl. 177-229.000.
Kobayashi, Kiyohiko: *See—*
Hayashi, Yutaka; Hamaguchi, Iwao; and Kobayashi, Kiyohiko, 4,567,061, Cl. 427-93.000.
Kobayashi, Minoru: *See—*
Iizuka, Kenichi; Uzuhashi, Hideo; Uneyama, Yoshihisa; Matuda, Michiya; and Kobayashi, Minoru, 4,566,289, Cl. 62-228.400.
Kobayashi, Toyohiro; Mochizuki, Shoji; Murata, Mitsuru; Tsuboi, Shunji; and Sakurai, Hideto, to Mitsubishi Denki Kabushiki Kaisha. Dot-matrix print controller. 4,566,813, Cl. 400-120.000.
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Yamauchi, Takashi; and Iizuka, Akira, to Kureha Kagaku Kogyo Kabushiki Kaisha. 2-[Para-(2-substituted or unsubstituted-3,3,3-tri-fluoropropyl)phenyl]propionic acid or a salt thereof. 4,567,293, Cl. 562-496.000.
Koboshi, Shigeharu; and Kurematsu, Masayuki, to Konishiroku Photo Industry Co., Ltd. Method for processing of light-sensitive silver halide color photographic material. 4,567,134, Cl. 430-372.000.
Koch, Frank, to Koch, Linda. Magnetic thickness gauge with adjustable probe. 4,567,436, Cl. 324-230.000.
Koch, Linda: *See—*
Koch, Frank, 4,567,436, Cl. 324-230.000.
Kochakis, Donald G. Padlock security cover. 4,566,296, Cl. 70-56.000.
Koeck, Klaus, to Licentia Patent-Verwaltungs-GmbH. Service integrated digital transmission system. 4,567,586, Cl. 370-4.000.
Koehler, Gerald C., to Worldtronics International, Inc. Electronic cycle timer for a household appliance. 4,566,802, Cl. 368-9.000.
Koester, Eberhard: *See—*
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.
Koga, Kunio: *See—*
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.
Kogel, Karl: *See—*
Smuda, Siegfried; Horner, Peter; Kogel, Karl; and Zeitler, Peter, 4,566,673, Cl. 254-84.000.
Koh, Yun B., to Fairchild Camera & Instrument Corporation. Method for controlling lateral diffusion of silicon in a self-aligned $TiSi_2$ process. 4,567,058, Cl. 427-55.000.
Kohler, Gernot: *See—*
Naarmann, Herbert; Heckmann, Walter; Kohler, Gernot; and Simak, Petr, 4,567,250, Cl. 528-423.000.
Kohler, Karl-Heinz: *See—*
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.

Kohli, Jerry L.: *See*—
Friedman, Harvey W.; Kohli, Jerry L.; and DeMur, Cynthia L., 4,566,721, Cl. 281-31.000.
Kohno, Yoshiki: *See*—
Hasegawa, Hiroshi; Shinzawa, Akira; and Kohno, Yoshiki, 4,566,994, Cl. 252-574.000.
Koike, Ichiro: *See*—
Yabe, Hideo; and Koike, Ichiro, 4,567,413, Cl. 318-489.000.
Koishikawa, Hirotoshi: *See*—
Yoshida, Ryuichi; Suzuki, Shigeru; Koishikawa, Hirotoshi; Miyamoto, Yoshimi; and Kawai, Kazuhide, 4,566,751, Cl. 339-218.00S.
Koizumi, Junji: *See*—
Sasaki, Koji; and Koizumi, Junji, 4,567,235, Cl. 525-113.000.
Sasaki, Koji; and Koizumi, Junji, 4,567,238, Cl. 525-179.000.
Koizumi, Yusuke; Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,566,711, Cl. 280-91.000.
Kojima, Hidetaka: *See*—
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.
Kojima, Tadashi: *See*—
Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, 4,567,568, Cl. 364-761.000.
Kojima, Yutaka: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, 4,567,114, Cl. 428-480.000.
Kokubo, Takashi: *See*—
Tomono, Hiromi; Kokubo, Takashi; Yamaguchi, Kazuki; and Ikuma, Sadao, 4,567,233, Cl. 525-71.000.
Kokusan Denki Co., Ltd.: *See*—
Nitou, Hiroyasu; Shirai, Kiyoshi; and Takahashi, Osamu, 4,566,425, Cl. 123-600.000.
Kollmeyer, Willy D.: *See*—
Payne, George B.; Soloway, Samuel B.; Powell, James E.; Roman, Steven A.; and Kollmeyer, Willy D., 4,567,283, Cl. 549-546.000.
Komada, Kenya: *See*—
Yuasa, Kazuhiro; and Komada, Kenya, 4,567,495, Cl. 346-153.100.
Komiya, Koji, to Iwatsu Electric Co., Ltd. Method and apparatus for converting analog signal into digital signal. 4,567,465, Cl. 340-347.0AD.
Komori, Hirohito: *See*—
Nishibori, Setsuo; Komori, Hirohito; Saeki, Syuji; and Kinoshita, Hiromitsu, 4,567,242, Cl. 525-534.000.
Komori Printing: *See*—
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.
Komori, Toshihisa: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,566,521, Cl. 164-160.100.
Komorizono, Junichi; and Miwa, Akihiko, to Aisin Seiki Kabushiki Kaisha. Inlet assembly for a brake master cylinder. 4,566,276, Cl. 60-585.000.
Kondo, Kiyoshi: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.
Kondo, Shinichi: *See*—
Umezawa, Hamao; and Kondo, Shinichi, 4,567,165, Cl. 514-36.000.
Kondoh, Shiroh, to Ricoh Company, Ltd. Magnetic toner developing device. 4,566,776, Cl. 355-3.0DD.
Kone Oy: *See*—
Nikulainen, Matti J., 4,566,381, Cl. 100-121.000.
Koning, Gerrit; and Schroeppel, Edward A., to Cordis Corporation. Apparatus and method for adjusting heart/pacer rate relative to right ventricular systolic pressure to obtain a required cardiac output. 4,566,456, Cl. 128-419.0PG.
Konishi, Kuniyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Light-receiving device for optical data transfer system. 4,567,446, Cl. 330-308.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Koboshi, Shigeharu; and Kurematsu, Masayuki, 4,567,134, Cl. 430-372.000.
Koyama, Mikio; and Okaniwa, Kenichiro, 4,567,024, Cl. 422-56.000.
Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, 4,567,136, Cl. 435-4.000.
Shiozawa, Kazuo; and Suzuki, Kijiro, 4,566,774, Cl. 354-413.000.
Konsevich, Francis X., to Boeing Company, The. Vibration damping stiffener. 4,566,231, Cl. 52-145.000.
Konstantinov, Alexandr A.: *See*—
Vinogradov, Georgy V.; Deinega, Jury F.; Yanovsky, Jury G.; Vasilieva, Olga V.; Konstantinov, Alexandr A.; and Chernysh, Mikhail M., 4,566,324, Cl. 73-60.000.
Koolen, Johannes L. A., to Dow Chemical Company, The. Apparatus and method for accurately measuring temperatures and temperature differences. 4,566,807, Cl. 374-112.000.
Kopke, Helmut: *See*—
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.
Koponen, Martti; and Tapio, Olli, to Valmet Oy. Transfer arrangement for guiding the paper web from the press section of a paper machine to it's drying section. 4,566,946, Cl. 162-359.000.
Koppenberg, Bruce G. Apparatus for casting concrete. 4,566,668, Cl. 249-60.000.
Koppers Company, Inc.: *See*—
Wallace, William E.; and Yu, Gui Y., 4,567,032, Cl. 423-644.000.
Korbacher, Werner: *See*—
Richter, Ekkehard; Knoblauch, Karl; Schlegel, Rolf; and Korbacher, Werner, 4,566,881, Cl. 55-25.000.
Korsgaard, Vagn, to V.I.K.-Consult ApS. Vapor barrier. 4,567,080, Cl. 428-137.000.
Korte, Kevin R.: *See*—
Sachleben, Leroy R.; Korte, Kevin R.; Snyder, Daniel D.; and Allen, Terry L., 4,566,468, Cl. 131-297.000.
Koshino, Yutaka: *See*—
Yasuda, Seiji; Koshino, Yutaka; and Yonezawa, Toshio, 4,566,174, Cl. 29-576.00W.
Kossin, Jacqualine. Flower support for wedding bouquets and the like. 4,566,221, Cl. 47-41.120.
Kotani, Masutoshi, to Iwatani & Co., Ltd. Aerator carried by automotive vehicle and control system therefor. 4,566,543, Cl. 172-4.000.
Kotobuki Engineering & Manufacturing Co., Ltd.: *See*—
Toda, Toshiyuki, 4,566,873, Cl. 494-53.000.
Kotone, Yoshiharu; and Hiraoka, Masaaki, to Nippon Pneumatic Manufacturing Co., Ltd. Control device for an air hoist. 4,566,675, Cl. 254-360.000.
Kovacs, Sandor, to Vasipari Kutato es Fejleszto Vallalat. Electromechanical measuring converter pin. 4,566,341, Cl. 73-862.650.
Koyama, Hiroshi; and Saito, Keiji, to Hitachi, Ltd. Control method and apparatus for rolling mill. 4,566,299, Cl. 72-8.000.
Koyama, Mikio; and Okaniwa, Kenichiro, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,567,024, Cl. 422-56.000.
Koyama, Mikio: *See*—
Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, 4,567,136, Cl. 435-4.000.
Koyo Seiko Company Limited: *See*—
Miyatake, Kiyoshi, 4,566,567, Cl. 192-45.000.
Kozponti Elelmiszeripari Kutato Intezet: *See*—
Kaffka, Karoly; Nadai, Bela; Czabaffy, Andras; and Horvath, Lorand, 4,566,797, Cl. 356-402.000.
Kozuki, Susumu: *See*—
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.
Kraft, Wayne R.: *See*—
Wyatt, Virgil D.; Kraft, Wayne R.; and Thoma, Nandor G., 4,567,561, Cl. 364-200.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Friesner, Karl; Bege, Dietmar; Erbse, Dietmar; and Meininger, Siegfried, 4,566,204, Cl. 34-15.000.
Muller, Rainer; and Schiffers, Ulrich, 4,566,267, Cl. 60-39.070.
Kramer, Robert W., to Hughes, H. Mervin, II. Skin temperature control. 4,566,455, Cl. 128-380.000.
Krawczyk, Simon W., to Fab Industries, Inc. Double faced knit fabric and method. 4,567,075, Cl. 428-91.000.
Kreutze, Gerhard: *See*—
Obstfelder, Gunther; Kreutze, Gerhard; and Luttig, Winfried, 4,567,489, Cl. 346-76.0PH.
Kroeplien, Udo; and Rosdorfer, Joachim, to Coca-Cola Company, The. 2-Acylimidazole compounds, their synthesis and use as medicinal agents. 4,567,194, Cl. 514-400.000.
Krolla, Hans-Georg: *See*—
Gliemeroth, Georg; Speit, Burkhard; and Krolla, Hans-Georg, 4,566,987, Cl. 252-301.40F.
Krones AG Hermann Kronseder, Maschinenfabrik: *See*—
Schneider, Egon, 4,566,583, Cl. 198-459.000.
Kronogard, Clas O.: *See*—
Kronogard, Sven O., deceased; Kronogard, Clas O.; and Kronogard, Hakan, 4,566,279, Cl. 60-718.000.
Kronogard, Hakan: *See*—
Kronogard, Sven O., deceased; Kronogard, Clas O.; and Kronogard, Hakan, 4,566,279, Cl. 60-718.000.
Kronogard, Sven O., deceased (by Linden, Allen, administrator); Kronogard, Clas O.; and Kronogard, Hakan, to AB Volvo. Vehicle propulsion plant. 4,566,279, Cl. 60-718.000.
Kronos Incorporated: *See*—
Fedele, Vincent, 4,567,357, Cl. 235-377.000.
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Cyanohydrin phosphonates as pesticides. 4,567,168, Cl. 514-89.000.
Krupp Corpoplast Maschinenbau GmbH: *See*—
Hone, Norbert; Horwege, Claus; and Rosenkranz, Otto, 4,566,871, Cl. 425-525.000.
Kubiak, Mira C.: *See*—
Canfield, V. Robert; Woodring, William J.; and Kubiak, Mira C., 4,567,079, Cl. 428-131.000.
Kubo, Miyuki: *See*—
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, 4,567,472, Cl. 340-525.000.
Kubota, Kazuo: *See*—
Iwamoto, Shoji; and Kubota, Kazuo, 4,566,647, Cl. 242-67.10R.
Kuehnle, Manfred R., to Coulter Systems Corporation. Method of apparatus for liquid developing of electrostatic images in an electrophotographic imaging system including a looped image carrier. 4,566,781, Cl. 355-10.000.

Kuenzig, Ernest O. Tamperproof container neck construction. 4,566,601, Cl. 215-31.000.

Kuhn, Heinz, to Continental Gummi-Werke Aktiengesellschaft. Wheel and solid tire assembly having locking ring. 4,566,515, Cl. 152-402.000.

Kuhn, Milos J., to Phillips Petroleum Company. Direct determination of stacking velocities in three dimensional seismic prospecting. 4,567,582, Cl. 367-56.000.

Kukes, Simon G.: *See*—
Banks, Robert L.; and Kukes, Simon G., 4,567,159, Cl. 502-219.000.

Kulesza, Ralph J.; Wozniak, Walter J.; Disko, Harry; and Meyer, Burton C., to Marvin Glass & Associates. Magnetic drawing toy. 4,566,195, Cl. 33-27.110.

Kulig, Constantine W.; Kingsbury, Charles M.; and Beckwith, Bruce R., to Emhart Industries, Inc. Deflector adjustment for a glassware forming machine. 4,566,894, Cl. 65-304.000.

Kulprathipanja, Santi, to UOP Inc. Separation of 1,3-butadiene. 4,567,309, Cl. 585-829.000.

Kumadaki, Itsumaro: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Yamauchi, Takashi; and Iizuka, Akira, 4,567,293, Cl. 562-496.000.

Kumano, Masafumi; Kawashima, Ikue; Hirama, Masayuki; and Tsuji, Yasuhiro, to Tohoku Ricoh Co., Ltd.; and Chugai Seiyaku Kabushiki Kaisha. Vascular anastomosis apparatus. 4,566,453, Cl. 128-303.100.

Kumano, Mikio: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.

Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, to Japan Tobacco & Salt Public Co., The; and Tokyo Shisetsu Kogyo Kabushiki Kaisha. Cutting apparatus. 4,566,471, Cl. 131-317.000.

Kumo, Ichiro: *See*—
Yamazaki, Chikayasu; Torikai, Jun; and Kumo, Ichiro, 4,566,319, Cl. 73-160.000.

Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Method and apparatus for controlling reduction ratio of continuousl,/ variable transmission with engine coolant temperature compensation. 4,566,354, Cl. 74-866.000.

Kunz, Rino E., to GRETAG Aktiengesellschaft. Process and apparatus for the focusing of a beam of light on an object. 4,567,362, Cl. 250-201.000.

Kupper, Wilhelm, to W. Schlafhorst & Co. Assembly of a support and thread tensioners for a bobbin creel. 4,566,651, Cl. 242-150.00R.

Kuraray Co., Ltd.: *See*—
Maruyama, Hitoshi; Tanaka, Taku; and Okaya, Takuji, 4,567,221, Cl. 524-436.000.
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.

Kurashima, Hideo. Separable spring-latched cufflink with transversally pressable release lever. 4,566,155, Cl. 24-41.000.

Kurata, Hironobu: *See*—
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,567,086, Cl. 428-166.000.
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Yamauchi, Takashi; and Iizuka, Akira, 4,567,293, Cl. 562-496.000.
Ohya, Masaki; and Matsukura, Yoshihiro, 4,567,090, Cl. 428-214.000.

Kurematsu, Masayuki: *See*—
Koboshi, Shigeharu; and Kurematsu, Masayuki, 4,567,134, Cl. 430-372.000.

Kuriyama, Shizuo: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.

Kurosawa, Toshishige; Ishisaka, Satoru; Yasutomi, Kazuki; and Ishiwatari, Takanobu, to Ikari Corporation. Apparatus for automatically trapping and processing rats or the like. 4,566,218, Cl. 43-58.000.

Kurz, Jerome L. Isokinetic extractive sampling probe. 4,566,342, Cl. 73-863.030.

Kusakabe, Masayoshi, to Nippon Electric Glass Company, Limited. Molds used for blowing glass articles. 4,566,895, Cl. 65-319.000.

Kusakabe, Tetsuo; Sakai, Tetsuro; and Honda, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Color television signal conversion device. 4,567,507, Cl. 358-11.000.

Kushibiki, Junichi: *See*—
Chubachi, Noriyoshi; Kushibiki, Junichi; and Nakanishi, Kouichi, 4,566,333, Cl. 73-642.000.

Kusumoto, Koshi: *See*—
Yuasa, Shigeki; Okabayashi, Minahiro; Ohno, Hideki; Suzuki, Katsumi; and Kusumoto, Koshi, 4,567,030, Cl. 423-326.000.

Kutovoi, Valentin I.: *See*—
Gorlov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., 4,566,587, Cl. 198-732.000.

Kutscher, Erwin: *See*—
Maier, Peter; Attinger, Karl; Sigel, Albert; Hansel, Gernot; Kutscher, Erwin; and Walter, Hartmut, 4,566,830, Cl. 409-182.000.

Kuwabara, Hideki; and Sudo, Yoshimi, to Japan Styrene Paper Corporation. Preliminarily foamed particles of non-crosslinked polypropylene-type resin. 4,567,208, Cl. 521-59.000.

Kuwait Institute for Scientific Research: *See*—
Owaysi, Fathi A.; and Al-Ameeri, Rasheed S., 4,567,315, Cl. 585-827.000.

Kuwayama, Tetsuro: *See*—
Tanaka, Nobuyoshi; Hashimoto, Seiji; and Kuwayama, Tetsuro, 4,567,510, Cl. 358-44.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Inoue, Seijiro; and Ota, Shigenori, 4,567,046, Cl. 426-20.000.
Shimada, Kenjiro; Otomo, Masao; Tomita, Fusao; and Ito, Shingo, 4,567,164, Cl. 514-33.000.

Kyster, Erik: *See*—
Petersen, Hans C.; and Kyster, Erik, 4,566,272, Cl. 60-384.000.

La Calhene, Societe Anonyme: *See*—
Francois, Daniel; and Mercey, Gilles, 4,567,417, Cl. 318-632.000.

Label-Aire Inc.: *See*—
Crankshaw, Michael; and Allen, George A., 4,566,933, Cl. 156-444.000.

Lai, Mun F.: *See*—
Fellner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., 4,567,189, Cl. 514-338.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Marhic, Gerard, 4,567,346, Cl. 219-121.0PB.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,567,567, Cl. 364-709.000.

Lakeland Rubber Stamp Company, Inc.: *See*—
Bronson, James C.; and Wright, Donald C., Jr., 4,566,382, Cl. 101-35.000.

Lam, Chiu T.; and Shannon, David M., to Dow Chemical Company, The. Production of phenols and catalyst therefor. 4,567,157, Cl. 502-208.000.

Lammerich, Walter: *See*—
Becker, Franz-Josef; Hubner, Erich; and Lammerich, Walter, 4,567,098, Cl. 428-327.000.

Lamparsky, Dietmar; and Kaiser, Roman, to Givaudan Corporation. 2-Methyl-2-buten-1-yl tiglate. 4,567,291, Cl. 560-225.000.

Lamparter, Hansruedi: *See*—
Sommer, Hans-Jorg; Lamparter, Hansruedi; and Wermelinger, Maurizio, 4,566,642, Cl. 242-18.00R.

Landfors, Arthur A., to Varian Associates, Inc. Method of and apparatus for operating a diffusion pump. 4,566,861, Cl. 417-54.000.

Landin, Heather V.: *See*—
Johnson, Gilbert C.; and Landin, Heather V., 4,567,237, Cl. 525-170.000.

Landrum, Ralph A., Jr., to Western Geophysical Company of America. Adaptive preset force level control for a seismic vibrator. 4,567,583, Cl. 367-190.000.

Lane, Wendell C., Jr., to Dana Corporation. Pressure plate strap drive apparatus and method. 4,566,573, Cl. 192-70.180.

Lang, Gerhard, to Braun Aktiengesellschaft. Method and circuit for optical and/or acoustic indication of the charge state of a battery or a storage battery. 4,567,476, Cl. 340-636.000.

Lang, Hans-Jorg: *See*—
Schwerdtel, Ernst; and Lang, Hans-Jorg, 4,566,249, Cl. 53-55.000.

Langner, Carl: *See*—
Fastert, Herbert; and Langner, Carl, 4,566,526, Cl. 164-478.000.

Lapeyre, James M. Internal combustion engine. 4,566,408, Cl. 123-51.00B.

Lapeyre, James M., to Laitram Corporation, The. Computer keyboard displaying many operating instructions with few keys. 4,567,567, Cl. 364-709.000.

Large, Michael S.: *See*—
Edwards, Philip N.; and Large, Michael S., 4,567,174, Cl. 514-210.000.

Larsen, Charles G.: *See*—
Hiday, David R.; and Larsen, Charles G., 4,567,523, Cl. 358-191.100.

Larson, James M.; and Noreen, Allen L., to Minnesota Mining and Manufacturing Company. Composite low surface energy liner of perfluoropolyether. 4,567,073, Cl. 428-40.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,567,183, Cl. 514-264.000.

Laskowski, Kenneth W.: *See*—
Britt, James E.; Laskowski, Kenneth W.; Sisson, Jeffrey L.; and Rinehart, Stephen A., 4,566,782, Cl. 355-14.0SH.

Latarius, Hans R., to Tekmar Angewandte Elektronik GmbH & Co. KG. Method of and system for controlling the ratio between the water flow rate in the primary circuit and the water flow rate in the secondary circuit of a hot water heating system. 4,566,628, Cl. 237-8.00C.

Latchum, John W., Jr., to Phillips Petroleum Company. Apparatus and method for drying solid materials. 4,567,340, Cl. 219-10.410.

Latzin, Dieter: *See*—
Fabian, Rainer; Marold, Freimut; and Latzin, Dieter, 4,566,886, Cl. 62-11.000.

Lau, Wah. Adjustable buckle. 4,566,158, Cl. 24-580.000.

Lau, Yue-Ying: *See*—
Barnett, Larry R.; Lau, Yue-Ying; Chu, Kwo R.; and Granatstein, Victor L., 4,567,401, Cl. 315-5.000.

Laubie, Michel: *See*—
Malen, Charles; Peglion, Jean-Louis; Laubie, Michel; and Poignant, Jean-Claude, 4,567,181, Cl. 514-256.000.

Laurent, Henry: *See*—
Hofmeister, Helmut; Laurent, Henry; Annen, Klaus; and Wiechert, Rudolf, 4,567,002, Cl. 260-397.400.

Lavielle, Gilbert; and Cudennec, Claude, to ADIR, s.a.r.l. Nitrosourea substituted phosphonates and pharmaceutical use. 4,567,169, Cl. 514-089.000.

Lawrence, James, to Sanders Associates, Inc. Pinch roller assembly. 4,567,491, Cl. 346-136.000.

Lawton, William R., to Graphic Controls Corporation. Color reversing compositions. 4,567,019, Cl. 422-57.000.

Laxton, Raymond: *See*—
Smith, Peter E.; and Laxton, Raymond, 4,567,511, Cl. 358-84.000.

Lease, William O.: *See*—
O'Meara, Joseph D., Jr.; Yuan, Herbert H.; Lease, William O.; and Stapleton, Robert G., 4,567,373, Cl. 250-573.000.

Le Clerc, Georges-Marie J.: *See*—
Bernard, Alain M.; Le Clerc, Georges-Marie J.; and Foulon, Bernard M., 4,566,328, Cl. 73-517.00B.

Lecomte, Daniel; and Gibaud, Michel, to Thomson CSF-Telephone. Electronic digital PCM time-division exchange with decentralized architecture. 4,567,589, Cl. 370-58.000.

Lee, Chi-Long: *See*—
Bauman, Therese M.; and Lee, Chi-Long, 4,567,212, Cl. 521-122.000.

Lee, Do I.: *See*—
Van Gilder, Ron L.; and Lee, Do I., 4,567,099, Cl. 428-327.000.

Lee, Jack W.: *See*—
Miller, Jule A.; Lee, Jack W.; and Thyssen, Jeffrey, 4,566,939, Cl. 156-655.000.

Lee, Richard J. Hand held cartridge reloading press. 4,566,366, Cl. 86-24.000.

Lee, Ronald B.: *See*—
Srivastava, Gopal K.; and Lee, Ronald B., 4,567,447, Cl. 331-1.00A.

Leebrick, David H., to Harris Corporation. Method of determining position on a wafer. 4,566,796, Cl. 356-401.000.

Leesona Corporation: *See*—
Benjamin, Kenneth A., 4,566,646, Cl. 242-45.000.

Legatti, Raymond H., to Technology Research Corporation. Resettable circuit closing device. 4,567,456, Cl. 335-20.000.

Legler, John G.: *See*—
Bartlett, Robert L.; Haas, Charles J.; and Legler, John G., 4,566,510, Cl. 144-1.00C.

Lehmann, Gunthart, to Maschinenbau Oppenweiler GmbH. Cutting device for sheets with at least one rotating cutting knife and conveyer. 4,566,360, Cl. 83-409.000.

Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, to BASF Aktiengesellschaft. Magnetic recording media. 4,567,108, Cl. 428-425.900.

Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, to BASF Aktiengesellschaft. Magnetic recording media. 4,567,109, Cl. 428-425.900.

Leiby, Robert W., to Hewlett-Packard Company. Method and apparatus for reducing crosstalk effects upon phase measurement. 4,567,462, Cl. 340-347.00P.

Leigh-Monstevens, Keith V.; and Wrobleski, David L., to Automotive Products plc. Clutch throw-out bearing and bearing carrier assembly. 4,566,578, Cl. 192-98.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Pease, Roger F.; Tuckerman, David B.; and Swanson, Richard M., 4,567,505, Cl. 357-81.000.

Lemaitre, Guy. Flat acoustic diffuser. 4,566,557, Cl. 181-150.000.

Le Martret, Odile: *See*—
Delevallee , Francoise ; Deraedt, Roger; and Le Martret, Odile, 4,567,198, Cl. 514-513.000.

Lemche, Josef, to Siemens Aktiengesellschaft. Locking mechanism for a bipartite keyboard housing. 4,567,336, Cl. 200-305.000.

Lemme, Charles D., to Blazer International Corp. Automatic takeup and overload protection device for shape memory metal actuator. 4,567,549, Cl. 362-279.000.

Lenz, Werner: *See*—
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.

Leonard, John J.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,567,307, Cl. 585-330.000.

Leopold, Wilbur R., Jr.; and Humes, Dennis W., to Mueller Co. Tamperproof fire hydrants. 4,566,481, Cl. 137-296.000.

Lepage, Jean-Luc; and Soula, Gerard, to Rhone-Poulenc Specialites Chimiques. Preparation of hydrogenated silanes by redistribution of hydrosilanes. 4,567,286, Cl. 556-469.000.

Le Pierres, Gildas, to Vibrachoc. Vibration damper and in particular frequency adapter for a helicopter blade. 4,566,677, Cl. 267-140.100.

Leroux, Jacques. Safety clasp for a necklace or bracelet chain. 4,566,159, Cl. 24-599.000.

Le Saige de la Villesbrunne, Arnaud G.: *See*—
Brown de Colstoun, Francois P. D.; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; Moscovici, Jean-Claude M.; and Moscovici, Michel, 4,567,367, Cl. 250-340.000.

Lescoeur, Jean A.: *See*—
Moussy, Jacques L.; and Lescoeur, Jean A., 4,566,541, Cl. 166-318.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-Heteryl-1,6-naphthyridin-2(1H)-ones, cardiotonic use thereof and intermediates therefor. 4,567,186, Cl. 514-300.000.

Leskovec, Edward V.: *See*—
Wiblin, Wayne T.; Melocik, Grant C.; Leskovec, Edward V.; and Pickering, William, 4,567,467, Cl. 340-347.00P.

L'Etat Francais represente par le Delegue Ministeriel pour L'Armement: *See*—
Duguet, Jean, 4,566,921, Cl. 149-22.000.

LeVeen, Eric G.: *See*—
Piccone, Vincent A.; Piccone, John N.; Piccone, Louis A.; LeVeen, Robert F.; and LeVeen, Eric G., 4,566,464, Cl. 128-732.000.

LeVeen, Robert F.: *See*—
Piccone, Vincent A.; Piccone, John N.; Piccone, Louis A.; LeVeen, Robert F.; and LeVeen, Eric G., 4,566,464, Cl. 128-732.000.

Lever Brothers Company: *See*—
Schmidt, Werner J., 4,567,056, Cl. 426-607.000.

Levin, Alexandr G.: *See*—
Gorlov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., 4,566,587, Cl. 198-732.000.

Levin, Jordan, to Fiberite Corporation. High conductivity graphite material and method of weaving. 4,567,094, Cl. 428-256.000.

Levine, Peter A., to RCA Corporation. Smear reduction in CCD imagers using empty well clocking. 4,567,524, Cl. 358-213.000.

Lewiner, Jacques; and Charpak, Georges. Read-out devices of electric charge distributions on dielectric surfaces. 4,567,530, Cl. 358-295.000.

Lewis, Edward L.; Parr, Jack E.; Fox, Mark A.; and Fuson, Robert L., to Zimmer, Inc. Prosthetic device with spacers. 4,566,138, Cl. 623-22.000.

Li, Hsin L.; Morris, Thomas K.; Seal, David B.; and Limoncelli, Edward V., to Allied Corporation. Nozzle assembly. 4,566,525, Cl. 164-463.000.

Libouton, Jean-Claude; Waterlot, Lucien; and Van Roy, Georges. Compositions of the explosive emulsion type, process for their manufacture and application of these compositions. 4,566,920, Cl. 149-21.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Koeck, Klaus, 4,567,586, Cl. 370-4.000.

Lichtblau, George J. Resonant tag and deactivator for use in an electronic security system. 4,567,473, Cl. 340-572.000.

Liese, Grover J.; and Pong, William. Fiber-optic stylet for needle tip localization. 4,566,438, Cl. 128-6.000.

Likhite, Vilas V. Mutant strain of *Listeria monocytogenes* and its use in production of IgM antibodies and as an immunotherapeutic agent. 4,567,041, Cl. 424-87.000.

Likitanupak, Chalerm. Windmill. 4,566,853, Cl. 416-117.000.

Likozar, Joseph M.: *See*—
Compton, William H.; and Likozar, Joseph M., 4,566,340, Cl. 73-862.480.

Lillie, James D.; and Skibbe, Rodney D. Honing tool. 4,566,229, Cl. 51-241.0VS.

Lim, Hong S., to Hughes Aircraft Company. Nickel-hydrogen bipolar battery. 4,567,119, Cl. 429-59.000.

Limited Company of Shinoda Sekkei Jimusho: *See*—
Shinoda, Morimasa; and Takahashi, Takamasa, 4,567,506, Cl. 358-11.000.

Limoncelli, Edward V.: *See*—
Li, Hsin L.; Morris, Thomas K.; Seal, David B.; and Limoncelli, Edward V., 4,566,525, Cl. 164-463.000.

Lin, I. Sioun: *See*—
Waxman, Burton H.; and Lin, I. Sioun, 4,567,035, Cl. 424-47.000.

Linde Aktiengesellschaft: *See*—
Fabian, Rainer; Marold, Freimut; and Latzin, Dieter, 4,566,886, Cl. 62-11.000.
Reimann, Hans; and Fuchs, Uwe, 4,566,971, Cl. 210-616.000.

Linden, Allen, administrator: *See*—
Kronogard, Sven O., deceased; Kronogard, Clas O.; and Kronogard, Hakan, 4,566,279, Cl. 60-718.000.

Lindenbauer, Leo K. Solar energy collector. 4,566,434, Cl. 126-440.000.

Linder, Heinz, to Grapha-Holding Aktiengesellschaft. Apparatus for changing the direction of advancement of a stream of paper sheets or the like. 4,566,582, Cl. 198-367.000.

Lindig, Christian, to VDO Adolf Schindling AG. Analog display device, particularly a tachometer. 4,567,434, Cl. 324-160.000.

Lindley, Michael G., to Tate & Lyle Public Limited Company. Method of inhibiting sweetness. 4,567,053, Cl. 426-538.000.

Lindner, Hans-Jurgen: *See*—
Bottcher, Rolf; and Lindner, Hans-Jurgen, 4,566,681, Cl. 270-58.000.

Lindstrom, John W., to Hi-Speed Checkweigher Co., Inc. Weighing conveyor. 4,566,584, Cl. 198-504.000.

Link, Julian V., Jr.; and Cronan, Ronald E., to Marine Systems, Inc. Noise barrier. 4,566,558, Cl. 181-210.000.

Lisowyj, Bohdan, to InterNorth, Inc. Method for extraction of iron aluminum and titanium from coal ash. 4,567,026, Cl. 423-81.000.

Litaker, Stephen H. Insulating trap door cover. 4,567,074, Cl. 428-71.000.

Littek, Harald: *See*—
Bochinski, Rolf; Eimer, Klaus; Littek, Harald; and Nasse, Johannes, 4,566,533, Cl. 165-95.000.

Little Giant Industries, Inc.: *See*—
Boothe, Leland H., 4,566,150, Cl. 16-332.000.

Liu, Nan-I; and van der Meer, Roelof, to General Electric Company. Synergistic effect of metal flake and metal or metal coated fiber on EMI shielding effectiveness of thermoplastics. 4,566,990, Cl. 252-503.000.

Livsey, Robert A., to Quest Corporation. Digital servo indicator. 4,567,429, Cl. 324-99.00D.

Ljubman, Nazar Y.; Imangazieva, Gulsara K.; Nugmanova, Lyalya T.; Uskov, Alexandr I.; Sydykova, Tokhobubu C.; and Kim, Zinaida I. Polymeric material adapted for physico-chemical separation of substances and method for producing same. 4,567,207, Cl. 521-35.000.

Lloyd, Norman E., to Nabisco Brands, Inc. Process for isomerizing glucose. 4,567,142, Cl. 435-94.000.

Lockheed Corporation: *See*—
Kellogg, James A., 4,566,502, Cl. 140-92.100.

Lockwood, Lawrence B. Automatic information, goods and services dispensing system. 4,567,359, Cl. 235-381.000.

Loeb, Ruediger: *See*—
Reimann, Kurt; Ackermann, Bernd; Loeb, Ruediger; and Ruther, Claus, 4,567,411, Cl. 318-341.000.

Loefqvist, Johan, to HB Varix. Method for applying and/or keeping an ischaemic area during surgery on the limbs. 4,566,436, Cl. 128-1.00R.

Loffland Brothers Company: *See*—
Johnson, Earl R., 4,566,579, Cl. 192-113.00B.

Lohausen, Viktor. Jointed arm mechanism for an awning. 4,566,516, Cl. 160-22.000.

Lombardino, Joseph G., to Pfizer, Inc. Antiinflammatory salts of piroxicam. 4,567,179, Cl. 514-225.000.

Long, Alden O., Jr.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.

Long, Dennis D.: *See*—
Gershenson, Meir; Sweeny, Mark F.; Long, Dennis D.; and Fleming, David L., 4,567,438, Cl. 324-248.000.

Longenecker, Howard H.: *See*—
Embree, David M.; Goldthorp, David C.; Longenecker, Howard H.; and Vogelpohl, David R., 4,567,333, Cl. 179-84.00T.

Longworth, Stuart W.: *See*—
Bennison, John J.; Longworth, Stuart W.; and Baker, John G., 4,566,972, Cl. 210-698.000.

L'Oreal: *See*—
Grollier, Jean F.; and Fourcadier, Chantal, 4,566,875, Cl. 8-406.000.

Lorenz, Lutz: *See*—
Huber, Johann; and Lorenz, Lutz, 4,566,722, Cl. 285-18.000.

Lotterbach, Gerhard: *See*—
van Belzen, David; Lotterbach, Gerhard; van Woudenberg, Jan F.; and Zucker, Udo, 4,566,309, Cl. 73-4.00R.

Lottes, Rosanna M.; and Swinehart, Grant E., to AT&T Bell Laboratories. Method and apparatus for providing a plurality of special services. 4,567,323, Cl. 179-18.00B.

Lotz, Alexander, to M.A.N. Maschinenfabrik Augsburg-Nurnberg. Cylindrical piston-type slide valve for pneumatic jigging machines. 4,566,487, Cl. 137-597.000.

Lotz, Horst K. Short tip for a torch and a torch type tool. 4,566,676, Cl. 266-48.000.

Lourenco, Jose A.: *See*—
Brasen, Daniel; DiGiuseppe, Michael A.; Lourenco, Jose A.; and Mahajan, Subhash, 4,566,934, Cl. 156-622.000.

Lowell, Seymour, to Quantachrome Corporation. Automatic volumetric sorption analyzer. 4,566,326, Cl. 73-432.0PS.

Loyd, Lew W., Jr., to Space Age Manufacturing Co., Inc. Method of making fireworks. 4,566,388, Cl. 102-361.000.

Loyola University of Chicago: *See*—
Babler, James H., 4,567,265, Cl. 546-16.000.

LTV Aerospace and Defense Company: *See*—
Harder, Isaac E., 4,567,007, Cl. 264-29.500.

Lubell, Michael; and Marks, Stephen. Health fitness monitor. 4,566,461, Cl. 128-668.000.

Lubrizol Corporation, The: *See*—
Hayashi, Katsumi, 4,566,983, Cl. 252-56.00R.

Lucas Industries Limited: *See*—
Chauveau, Jean-Marc; and Schmitt, Michel, 4,566,563, Cl. 188-18.00A.
Dufft, Jurgen, 4,566,623, Cl. 228-138.000.

Lucas Industries Public Limited Company: *See*—
Farr, Glyn P. R., 4,566,275, Cl. 60-554.000.
French, Geoffrey R.; Peltret, Pierre H.; and Chalke, Brian J., 4,566,271, Cl. 60-286.000.

Luckachina, John C., to United States of America, Navy. Pivotable support rescue hoist. 4,566,659, Cl. 244-137.00R.

Lullau, Georg. Photocopying machine. 4,566,787, Cl. 355-100.000.

Lumma, William C., Jr.: *See*—
Baldwin, John J.; Pietruszkiewicz, Adolph; Bolhofer, William A.; and Lumma, William C., Jr., 4,567,191, Cl. 514-362.000.

Luna, Carlos E.: *See*—
Beck, James P.; and Luna, Carlos E., 4,567,138, Cl. 435-15.000.

Lundgren, Bengt, to SKF Nova AB. Device for sealing a self-aligning rolling bearing. 4,566,811, Cl. 384-484.000.

Lundin, Sven-Ake; and Svensson, Arvid, to Svedala-Arbra AB. Cone crusher. 4,566,638, Cl. 241-37.000.

Luttig, Winfried: *See*—
Obstfelder, Gunther; Kreutze, Gerhard; and Luttig, Winfried, 4,567,489, Cl. 346-76.0PH.

Lynch, Frank: *See*—
Bozarth, Theodore B.; Demark, Anthony M.; Finn, Edward F.; and Lynch, Frank, 4,567,466, Cl. 340-347.0AD.

Lyons, Robert T., to Kabivitrum AB. Isotonic glycerol free intravenous fat emulsion. 4,567,045, Cl. 424-195.100.

M.A.N. Maschinenfabrik Augsburg-Nurnberg: *See*—
Lotz, Alexander, 4,566,487, Cl. 137-597.000.

M&T Chemicals Inc.: *See*—
Meunier, Gilles, 4,567,234, Cl. 525-73.000.

Maahs, Gunther: *See*—
Schuler, Ralf; and Maahs, Gunther, 4,567,220, Cl. 524-413.000.

Maaz, Gunther: *See*—
Sodler, Walter; Knothe, Erich; Maaz, Gunther; and Madge, Joachim, 4,566,548, Cl. 177-229.000.

Mabuchi, Kenichi; and Yagi, Masao, to Bio Mobuchi Co. Ltd. Massager. 4,566,442, Cl. 128-52.000.

MAC Valves, Inc.: *See*—
Neff, James A., 4,566,490, Cl. 137-625.650.

Mack, Henry J., Jr.: *See*—
Alie, Enrique; Gilmore, Arthur H.; and Mack, Henry J., Jr., 4,567,547, Cl. 362-154.000.

Madge, Joachim: *See*—
Sodler, Walter; Knothe, Erich; Maaz, Gunther; and Madge, Joachim, 4,566,548, Cl. 177-229.000.

Madison-Kipp Corporation: *See*—
Elliott, Kirk W.; Garver, Christian J.; Kayser, John P.; and Dombroski, Robert M., 4,566,560, Cl. 184-15.100.

Maeda, Takashi; and Sato, Masayuki, to Kabushiki Kaisha Daini Seikosha. Industrial robot. 4,566,847, Cl. 414-744.00R.

Maekawa, Hiroshi: *See*—
Arimoto, Satomi; Hirakawa, Hiroyuki; and Maekawa, Hiroshi, 4,567,538, Cl. 361-58.000.

Maekawa, Masakazu: *See*—
Ogata, Yasuhiro; and Maekawa, Masakazu, 4,567,496, Cl. 346-200.000.

Maekawa, Norio: *See*—
Okamoto, Magoji; and Maekawa, Norio, 4,566,641, Cl. 241-200.000.

Maes, Joseph M.: *See*—
Theuwis, Alfons L.; and Maes, Joseph M., 4,566,343, Cl. 73-864.590.

Maetani, Masami, to Canon Kabushiki Kaisha. Web transport device. 4,566,654, Cl. 242-204.000.

Magnino, Toney L. Quick erection tent for pickup trucks. 4,566,729, Cl. 296-159.000.

Mahajan, Subhash: *See*—
Brasen, Daniel; DiGiuseppe, Michael A.; Lourenco, Jose A.; and Mahajan, Subhash, 4,566,934, Cl. 156-622.000.

Mahnke, Parker E., to Marcy Gymnasium Equipment Co. Exercise bench. 4,566,691, Cl. 272-123.000.

Mahoney, Morgan D. Swimming pool wall construction in pools of the type using a metal side wall. 4,566,141, Cl. 4-506.000.

Maier & Co.: *See*—
Vesely, Gottfried, 4,566,169, Cl. 29-560.000.

Maier, Peter; Attinger, Karl; Sigel, Albert; Hansel, Gernot; Kutscher, Erwin; and Walter, Hartmut. Router with quick depth of cut adjustment. 4,566,830, Cl. 409-182.000.

Main, W. Eric: *See*—
Jarrett, Robert B.; Main, W. Eric; and Neidorff, Robert A., 4,567,388, Cl. 307-540.000.

Main, William E., to Motorola, Inc. Circuit and method for linearizing the output signal of an FM detector. 4,567,441, Cl. 329-103.000.

Maki, Kenichiro: *See*—
Nagato, Nobuyuki; Maki, Kenichiro; Uematsu, Tomoe; and Ishioka, Ryoji, 4,567,292, Cl. 560-245.000.

Maki, Yoshitaka: *See*—
Nohara, Akira; and Maki, Yoshitaka, 4,567,201, Cl. 514-571.000.

Makino, Syozaburo; Yoshikawa, Keiji; and Nakasho, Tukayo, to Nippon Selen Co., Ltd. Automatic supervisory system for a warper. 4,566,163, Cl. 28-187.000.

Maldonado, Paul: *See*—
Hagenbach, Germain; Maldonado, Paul; and Maurice, Jacques, 4,567,222, Cl. 524-476.000.

Malen, Charles; Peglion, Jean-Louis; Laubie, Michel; and Poignant, Jean-Claude, to ADIR, s.a.r.l. Bicyclo (4.2.0) 1,3,5-octatriene compounds and use as α-adrenergics. 4,567,181, Cl. 514-256.000.

Mallevialle, Joel: *See*—
Cognet, Louis; Argoud, Christian; Matray, Francois; and Mallevialle, Joel, 4,567,020, Cl. 422-101.000.

Maly, Rudolf, to Daimler-Benz Aktiengesellschaft. Mixture-compression internal combustion engine. 4,566,413, Cl. 123-256.000.

Mamiya, Isamu: *See*—
Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, 4,566,471, Cl. 131-317.000.

Mancinelli, Paul A., to Atlantic Richfield Company. Copolymers of terminally functional polymers. 4,567,239, Cl. 525-309.000.

Mandella, Michael J. High power laser system. 4,567,597, Cl. 372-34.000.

Mandle, Richard M., to Electro-Nucleonics, Inc. Cuvette array. 4,566,790, Cl. 356-246.000.

Mangum, Thomas M., to Ciba-Geigy Corporation. Stable, concentrated, liquid dispersions of anionic dyestuffs. 4,567,171, Cl. 514-150.000.

Mannesmann Rexroth GmbH: *See*—
Rotte, Hermann J.; and Bogl, Emil, 4,566,479, Cl. 137-312.000.

Manning, Larry F.; and Stanley, Andrea. Recorded and printed message carrier. 4,566,590, Cl. 206-232.000.

Mannschke, Lothar, to U.S. Philips Corporation. Optical star coupler. 4,566,753, Cl. 350-96.160.

Manville Service Corporation: *See*—
Jackson, Fred L., 4,567,215, Cl. 523-218.000.
Map Mikrofilm Apparatebau Dr. Poehler GmbH & Co. KG: *See*—
Walczak, Andrzej, 4,566,739, Cl. 308-3.00R.
Marchesini, Sisto, to Royal Plastic S.A. Dismountable folding chair. 4,566,731, Cl. 297-45.000.
Marcy Gymnasium Equipment Co.: *See*—
Mahnke, Parker E., 4,566,691, Cl. 272-123.000.
Marechal, Roger; and Jeantet, Lucien, to Rocamat. Device for cutting blocks of granite, marble, stone and the like materials. 4,566,427, Cl. 125-16.00R.
Marhic, Gerard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Arc-striking method for a welding or cutting torch and a torch adapted to carry out said method. 4,567,346, Cl. 219-121.0PB.
Marine Systems, Inc.: *See*—
Link, Julian V., Jr.; and Cronan, Ronald E., 4,566,558, Cl. 181-210.000.
Marinier, Robert P., Jr.: *See*—
Roberts, Timothy J.; Roberts, Thomas J., Jr.; Roberts, Thomas J., Sr.; and Marinier, Robert P., Jr., 4,566,142, Cl. 4-604.000.
Marinkovich, Vincent A.: *See*—
Sell, William J.; Riege, David H.; and Marinkovich, Vincent A., 4,567,149, Cl. 436-513.000.
Marks, Stephen: *See*—
Lubell, Michael; and Marks, Stephen, 4,566,461, Cl. 128-668.000.
Marold, Freimut: *See*—
Fabian, Rainer; Marold, Freimut; and Latzin, Dieter, 4,566,886, Cl. 62-11.000.
Maros, Ronald R., to Cooper Industries, Inc. Connector assembly. 4,566,745, Cl. 339-14.00P.
Marozzi, Alfred A. Article imprinter and cartridge inker. 4,566,387, Cl. 101-330.000.
Marquardt, Klaus: *See*—
Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Staudinger, Gunther, 4,567,297, Cl. 564-208.000.
Marshall, Jeffrey F., to PT Components, Inc. Multiple-disc electromagnetic clutch. 4,566,574, Cl. 192-84.00C.
Martin, Dennis R., to Draper Technologies, Inc. Coin operated dispensers for dispensing horizontally disposed articles such as newspapers from the upper end of a stack. 4,566,581, Cl. 194-248.000.
Martin, Henry; and Fricker, Urs, to Ciba-Geigy Corporation. Novel oxime ethers, the preparation thereof, compositions containing them and the use thereof. 4,566,901, Cl. 71-105.000.
Martin, Philip T., to ITT Corporation. Electronic hybrid having synthesized impedance circuitry. 4,567,331, Cl. 179-170.0NC.
Martin Processing, Inc.: *See*—
Hermes, Julius, 4,566,645, Cl. 242-35.50R.
Martin, Ralph E.; and Puidak, Heino, to Continental Can Company, Inc. Capacitive article density monitor. 4,567,410, Cl. 318-332.000.
Martinez, Manuel T. Method and apparatus for removing defective corrugated board by splicing. 4,566,922, Cl. 156-64.000.
Maru, Hansraj: *See*—
Patel, Pinakin; Dharia, Dilip; and Maru, Hansraj, 4,567,117, Cl. 429-19.000.
Maruyama, Hitoshi; Tanaka, Taku; and Okaya, Takuji, to Kuraray Co., Ltd. Water resistant compositions. 4,567,221, Cl. 524-436.000.
Marvin Glass & Associates: *See*—
Kulesza, Ralph J.; Wozniak, Walter J.; Disko, Harry; and Meyer, Burton C., 4,566,195, Cl. 33-27.110.
Marx, Hans-Norbert; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Salts of 2-(methoxy-carbonylamino)-benzimidazole. 4,567,277, Cl. 548-306.000.
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Antiskid control with wheel-speed difference compensation. 4,566,737, Cl. 303-109.000.
Maschinenbau Oppenweiler GmbH: *See*—
Lehmann, Gunthart, 4,566,360, Cl. 83-409.000.
Masler, William F., III; and Amjad, Zahid, to B. F. Goodrich Company, The. Scale inhibition in water systems. 4,566,973, Cl. 210-701.000.
Masler, William F., III; and Amjad, Zahid, to B. F. Goodrich Company, The. Method of inhibiting scale with copolymer. 4,566,974, Cl. 210-701.000.
Mason, Anthony, to Whirlpool Corporation. Neutral pump-out for automatic washer. 4,566,295, Cl. 68-12.00R.
Massachusetts Institute of Technology: *See*—
Jarvinen, Philip O., 4,567,110, Cl. 428-433.000.
Massey, James L.; and Omura, Jimmy K., to Omnet Associates. Method and apparatus for maintaining the privacy of digital messages conveyed by public transmission. 4,567,600, Cl. 375-2.100.
Mast Immunosystems, Ltd.: *See*—
Sell, William J.; Riege, David H.; and Marinkovich, Vincent A., 4,567,149, Cl. 436-513.000.
Masterman, Hugh C.: *See*—
Sawyer, Carleton E.; and Masterman, Hugh C., 4,566,179, Cl. 29-596.000.
Masuda, Akira: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.
Masuda, Takeshi: *See*—
Sawa, Natsuo; Masuda, Takeshi; and Mizui, Takashi, 4,567,259, Cl. 544-207.000.
Masui, Motonobu: *See*—
Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, 4,567,403, Cl. 315-47.000.
Masumoto, Tsuyoshi; Inoue, Akihisa; Takahashi, Yoshimi; Hoshi, Akira; and Mizutani, Uichiro, to Aisin Seiki Kabushiki Kaisha. Liquid helium level indicating gauge. 4,566,323, Cl. 73-295.000.
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, to Fuji Photo Film Co., Ltd. Method of making magnetic recording medium. 4,567,057, Cl. 427-48.000.
Matray, Francois: *See*—
Cognet, Louis; Argoud, Christian; Matray, Francois; and Mallevialle, Joel, 4,567,020, Cl. 422-101.000.
Matson, James A., to Bristol-Myers Company. Process for preparing 4'-deschlororebeccamycin. 4,567,143, Cl. 435-119.000.
Matsuda, Hiroto: *See*—
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,567,493, Cl. 346-140.00R.
Matsuda, Ikuo: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,566,422, Cl. 123-559.000.
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, to Toyo Soda Manufacturing Co., Ltd.; and Sagami Chemical Research Center. Fluorocarbon polymers and processes for their preparation. 4,567,206, Cl. 521-27.000.
Matsuki, Taketo: *See*—
Tominaga, Ichiro; and Matsuki, Taketo, 4,567,219, Cl. 524-413.000.
Matsukura, Yoshihiro: *See*—
Ohya, Masaki; and Matsukura, Yoshihiro, 4,567,090, Cl. 428-214.000.
Matsumoto, Hiroshi, to Seikosha Co., Ltd. Structure for mounting roller on shaft. 4,566,815, Cl. 400-641.000.
Matsumoto, Katsutoshi, to Dainippon Screen Mfg. Co., Ltd.; and Toray Industries, Inc. Intaglio printing plate and printing method. 4,566,384, Cl. 101-170.000.
Matsumoto, Masato: *See*—
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, to Kuraray Company, Ltd.; and Daicel Chemical Industries, Ltd. Process for continuous hydroformylation of allyl alcohol. 4,567,305, Cl. 568-454.000.
Matsumura, Kiyotoshi: *See*—
Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, 4,566,996, Cl. 260-239.00A.
Matsumura, Teruyuki: *See*—
Nozawa, Ryoichiro; Kinoshita, Mitsuo; and Matsumura, Teruyuki, 4,567,342, Cl. 219-69.00M.
Matsumura, Wakuo; Kitazawa, Noboru; and Ohigashi, Yoshiaki, to Unitika Ltd. Method and apparatus for producing bag-shaped packages with cap body and content. 4,566,250, Cl. 53-128.000.
Matsuno, Takumi: *See*—
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.
Matsuo, Hirohumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide-angle lens. 4,566,764, Cl. 350-459.000.
Matsuo, Seitaro: *See*—
Itsumi, Manabu; Ehara, Kohei; Muramoto, Susumu; and Matsuo, Seitaro, 4,566,940, Cl. 156-643.000.
Matsuse, Kohki; Hashimoto, Hitoshi; and Suzuki, Toshiaki, to Kabushiki Kaisha Meidensha. Current-type GTO inverter with surge energy restoration. 4,567,555, Cl. 363-138.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Yamaguchi, Kazufumi; and Murata, Takahiko, 4,567,529, Cl. 358-294.000.
Matsushita Electric Works, Ltd.: *See*—
Kitagawa, Yoshiaki; Ohki, Koichiro; and Sarada, Toshio, 4,567,351, Cl. 219-341.000.
Onogi, Toshiro; Yoda, Kenichi; and Kitamura, Masahiko, 4,567,556, Cl. 364-140.000.
Tanishi, Tokio; and Yokoyama, Hideki, 4,566,748, Cl. 339-95.00D.
Matsushita, Ken; and Onishi, Tetsuo, to Duplo Seiko Corporation; and Duplo Manufacturing Corporation. Winding apparatus for removing used stencil. 4,566,383, Cl. 101-121.000.
Matsuura, Toshio; and Suwa, Kyoichi, to Nippon Kogaku K.K. Alignment apparatus. 4,566,795, Cl. 356-400.000.
Mattern, Richard E.: *See*—
Keenan, Charles E.; Mattern, Richard E.; and Vaccaro, Charles A., 4,566,400, Cl. 116-171.000.
Matuda, Michiya: *See*—
Iizuka, Kenichi; Uzuhashi, Hideo; Uneyama, Yoshihisa; Matuda, Michiya; and Kobayashi, Minoru, 4,566,289, Cl. 62-228.400.
Matui, Kazuharu: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,566,521, Cl. 164-160.100.
Matusik, Frank J.; and Nelson, Donald W., to National Metal and Refining Company, Ltd. Rotational vibratory viscometer transducer and circuit. 4,566,181, Cl. 29-602.00R.
Mauchle, Peter: *See*—
Dobsa, Josip; Mauchle, Peter; Pfyl, Walter; and Sadek, Kadry, 4,567,424, Cl. 323-210.000.

Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., to General Dynamics Pomona Division. Steering mechanism for an explosively fired projectile. 4,566,656, Cl. 244-3.110.
Mauk, Gerhard; and Huinink, Heinrich, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,566,514, Cl. 152-209.00R.
Mauldin, Charles H.: *See*—
Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., 4,567,205, Cl. 518-715.000.
Mauranen, Pekka; and Vedenpaa , Timo, to Valmet Oy. Apparatus for cutting a lead-in strip from a paper web in a paper machine. 4,566,944, Cl. 162-286.000.
Maurice, Jacques: *See*—
Hagenbach, Germain; Maldonado, Paul; and Maurice, Jacques, 4,567,222, Cl. 524-476.000.
May, George N. Curb extrusion apparatus with interchangeable molds. 4,566,823, Cl. 404-98.000.
Mayer, Lily: *See*—
Joseph, Ady; Mayer, Lily; and Miutel, Alexander, 4,566,992, Cl. 252-518.000.
Mazda Motor Corporation: *See*—
Kanai, Seita; and Kanazawa, Hirotaka, 4,566,718, Cl. 280-708.000.
Tadokoro, Tomoo; Shiraishi, Hideo; and Okimoto, Haruo, 4,566,412, Cl. 123-216.000.
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,566,422, Cl. 123-559.000.
Mazzeo, Michael P.: *See*—
Rizk, Sidky D.; Hsieh, Harry W. S.; and Mazzeo, Michael P., 4,567,107, Cl. 428-425.500.
McBride, Alan L.: *See*—
Gray, James S.; Chamberlin, James W.; McBride, Alan L.; and Schreiner, Peter G., III, 4,567,591, Cl. 370-109.000.
McConnell, Robert K., to Wayland Research Inc. Method of and apparatus for pattern recognition. 4,567,610, Cl. 382-18.000.
McCoy, Randall E.: *See*—
Moldovan, Anton G.; and McCoy, Randall E., 4,566,224, Cl. 51-56.00R.
McCrory, Michael L.; and McCrory, Roy E. Feeding wildfowl decoy. 4,566,214, Cl. 43-3.000.
McCrory, Roy E.: *See*—
McCrory, Michael L.; and McCrory, Roy E., 4,566,214, Cl. 43-3.000.
McCutcheon, Arnold E. Agricultural work vehicle. 4,566,553, Cl. 180-237.000.
McDermott, Thomas C., to Rockwell International Corporation. Multiplex equipment monitoring apparatus. 4,567,587, Cl. 370-13.000.
McDonnell, Damien G.; and Smith, Robert A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Laterally fluorinated liquid crystal materials and frequency change devices. 4,566,759, Cl. 350-346.000.
McFarland, Archie R.; and Preece, Bruce L., to Beehive Machinery, Inc. Separating machine having overlapping screw pump. 4,566,640, Cl. 241-74.000.
McGinniss, Vincent, to Battelle Development Corporation. Electrodeposited continuous thin film transfer process for producing film functional as barrier coatings. 4,566,962, Cl. 204-180.900.
McGinniss, Vincent D.; and Dick, Richard J., to Chugoku Marine Paints (USA) Inc. Anti-fouling paint containing leaching agent stabilizers. 4,566,906, Cl. 106-15.050.
McGregor, Douglas D., to Texas Instruments Incorporated. Apparatus for measuring the magnitude of a magnetic field. 4,567,439, Cl. 324-304.000.
McGuire, Hugh K. Flexible duct forming apparatus. 4,566,932, Cl. 156-429.000.
McKenna, Owen P., to BICC Public Limited Company. Extrusion machinery. 4,566,303, Cl. 72-262.000.
McOrmond, Philip M.: *See*—
O'Brien, Robert N.; McOrmond, Philip M.; Hocking, Martin B.; and Thornton, Kenneth R., 4,566,315, Cl. 73-61.400.
McStravick, David M.: *See*—
Baker, John R.; Chenoweth, David V.; and McStravick, David M., 4,566,495, Cl. 138-149.000.
McVey, Charles I., to General Electric Company. Increased efficacy high pressure sodium lamp yielded by increased wall temperature operation. 4,567,396, Cl. 313-25.000.
Mead Corporation, The: *See*—
Cooley, Jack S., 4,566,248, Cl. 53-48.000.
Muller, Rolf, 4,566,593, Cl. 206-611.000.
Wood, Prentice J.; Oliff, James R.; and Watkins, Richard K., 4,566,626, Cl. 229-37.00R.
Measuronics Corporation: *See*—
Schumacher, Peter M., 4,567,515, Cl. 358-107.000.
Mecilec: *See*—
Arnaud, Robert, 4,566,809, Cl. 374-126.000.
Medema, Pieter W.; and Benjamins, Elmo I., to U.S. Philips Corporation. Coffee maker. 4,566,374, Cl. 99-281.000.
Mednick, R. Lawrence; and Blum, David B., to Chem Systems, Inc. Method for making methanol. 4,567,204, Cl. 518-700.000.
Megatech Corporation: *See*—
Basmajian, Vahan V., 4,566,532, Cl. 165-45.000.
Megerle, Friedrich: *See*—
Melcher, Gerhard; Megerle, Friedrich; and Wuth, Wolfgang, 4,566,903, Cl. 75-26.000.
Mehl, Thomas L.; and Burdick, William S., to Mehl, Thomas L. Selected frequency hair removal device and method. 4,566,454, Cl. 128-303.130.
Mehta, Arun K.: *See*—
Borio, Donald C.; Borio, Richard W.; Hale, Gilbert L.; Mehta, Arun K.; and Tyler, Arnold L., 4,566,394, Cl. 110-347.000.
Meier, Linus; and Hanselmann, Roland, to Mettler Instrumente AG. Measuring instrument display with exchangeable legends for different languages or operating modes. 4,567,481, Cl. 340-784.000.
Meininger, Siegfried: *See*—
Friesner, Karl; Bege, Dietmar; Erbse, Dietmar; and Meininger, Siegfried, 4,566,204, Cl. 34-15.000.
Melby, Phillip J. Game racket having adjustable string mounts. 4,566,695, Cl. 273-73.00D.
Melcher, Gerhard; Megerle, Friedrich; and Wuth, Wolfgang, to Klockner-Humboldt-Deutz AG. Method for the pyrometallurgical treatment of fine grained solids to produce molten products. 4,566,903, Cl. 75-26.000.
Melman, Paul: *See*—
Carlsen, W. John; and Melman, Paul, 4,566,761, Cl. 350-401.000.
Melocik, Grant C.: *See*—
Wiblin, Wayne T.; Melocik, Grant C.; Leskovec, Edward V.; and Pickering, William, 4,567,467, Cl. 340-347.00P.
Melzer, Milena: *See*—
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.
Mentor Corporation: *See*—
Fogarty, Terence M., 4,566,446, Cl. 128-79.000.
Menzel, Stanley W. O.; Mominee, David E.; and Vance, Gilbert W., to J-M Manufacturing Company, Inc. Tubular plastics objects. 4,566,496, Cl. 138-154.000.
Menzies, Bruce K., to Geotechnical Digital Systems Limited. Pressure source. 4,566,868, Cl. 417-572.000.
Mercey, Gilles: *See*—
Francois, Daniel; and Mercey, Gilles, 4,567,417, Cl. 318-632.000.
Merck & Co., Inc.: *See*—
Baldwin, John J.; Pietruszkiewicz, Adolph; Bolhofer, William A.; and Lumma, William C., Jr., 4,567,191, Cl. 514-362.000.
Baldwin, John J., 4,567,276, Cl. 548-343.000.
Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., 4,567,289, Cl. 560-059.000.
Young, Steven D., 4,567,268, Cl. 546-116.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Peet, Norton P.; and Sunder, Shyam, 4,567,193, Cl. 514-381.000.
Merten, Josef: *See*—
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.
Meska, Robert J.; and Bishop, Mary F. Small appliance wall bracket. 4,566,666, Cl. 248-558.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Bittner, Helmut; Gottzein, Eveline; and Surauer, Michael, 4,567,564, Cl. 364-434.000.
Mestler, Donald C. Folding table support. 4,566,661, Cl. 248-171.000.
Metafuse Limited: *See*—
Joseph, Ady; Mayer, Lily; and Miutel, Alexander, 4,566,992, Cl. 252-518.000.
Metalines, Inc.: *See*—
Dunsworth, Charles L., 4,566,242, Cl. 52-573.000.
Metallurgie Hoboken-Overpelt: *See*—
Detournay, Jacquy J. C.; and Sterckx, Jozef V. M., 4,567,027, Cl. 423-101.000.
Metcalf, Travis W., to United States of America, Navy. Automatic character recognition system. 4,567,609, Cl. 382-9.000.
Metoki, Toshio: *See*—
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.
Metronic Electronic GmbH: *See*—
Bucher, Heinz, 4,566,443, Cl. 128-66.000.
Mettler Instrumente AG: *See*—
Meier, Linus; and Hanselmann, Roland, 4,567,481, Cl. 340-784.000.
Mettler, Rollin W., Jr. Integrated circuit module and method of making same. 4,567,545, Cl. 361-401.000.
Metzeler Kautschuk GmbH: *See*—
Gey, Mathias; Grote, Jurgen; Pittel, Horst; Samol, Gerd W.; and Zelt, Rainer, 4,567,085, Cl. 428-163.000.
Metzger, Gerhard: *See*—
Rau, Karl; Kalk, Heinz; and Metzger, Gerhard, 4,566,322, Cl. 73-295.000.
Meunier, Gilles, to M&T Chemicals Inc. Graft copolymers of alkyl methacrylates onto cross-linked butadiene - alkyl acrylate copolymers and their use as impact modifiers. 4,567,234, Cl. 525-73.000.
Meunier, Paul L.: *See*—
Castera, Jean P.; and Meunier, Paul L., 4,566,329, Cl. 73-597.000.
Meyer, Burton C.: *See*—
Kulesza, Ralph J.; Wozniak, Walter J.; Disko, Harry; and Meyer, Burton C., 4,566,195, Cl. 33-27.110.
Meyer, Olga: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,567,230, Cl. 524-786.000.
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, to BGB-Gesellschaft Reinmar John & Rainer Leo Meyer; and Meyer, Olga. 1-Component coating composition, utilization thereof and

process for manufacturing a protection coating. 4,567,230, Cl. 524-786.000.

Meyer, Rolf-Volker: *See—*
Hammer, Heinz; Kircher, Klaus; and Meyer, Rolf-Volker, 4,567,210, Cl. 521-90.000.

Michalski, William L., Jr. Apparatus and method for welding a stud to the surface of a workpiece. 4,567,344, Cl. 219-98.000.

Micro Power Systems, Inc.: *See—*
Hall, John H., 4,566,914. Cl. 148-1.500.

Microdot Inc.: *See—*
Peers, Robert P., 4,566,747, Cl. 339-74.00R.
Zitting, Gordon T., 4,566,703, Cl. 277-165.000.

Microglass, Inc.: *See—*
Butler, Robert M., 4,566,839, Cl. 414-404.000.

Microlife Technics, Inc.: *See—*
Olsen, Ronald H., 4,567,141, Cl. 435-91.000.

Micropure, Incorporated: *See—*
Sachar, Kenneth S.; and Rich, Stanley R., 4,566,636, Cl. 239-698.000.

Microtel B.V.: *See—*
van Halteren, Aart Z., 4,567,382, Cl. 307-400.000.

Migis, Ronald P.: *See—*
Enk, William A.; and Migis, Ronald P., 4,566,542, Cl. 169-62.000.

Miki, Joh: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,566,897, Cl. 71-88.000.

Mikiya, Toshio: *See—*
Takeuchi, Hirosato; and Mikiya, Toshio, 4,566,431, Cl. 126-437.000.

Mikuni Kogyo Kabushiki Kaisha: *See—*
Yamamoto, Minato; and Takahashi, Shunji, 4,566,418, Cl. 123-479.000.

Miles Laboratories, Inc.: *See—*
Johnson, Leighton C., 4,566,203, Cl. 34-9.000.

Miles, Ronald C., to Olin Corporation. Method of monitoring an electrolytic cell. 4,566,950, Cl. 204-1.00T.

Millar, Malcolm H.: *See—*
Hutton, Denis A.; and Millar, Malcolm H., 4,567,010, Cl. 264-117.000.

Miller, Arthur: *See—*
Hopkins, Maxwell M.; and Miller, Arthur, 4,566,893, Cl. 65-69.000.

Miller, Charles P., to Miller Formless Co., Inc. Construction machine. 4,566,822, Cl. 404-84.000.

Miller Formless Co., Inc.: *See—*
Miller, Charles P., 4,566,822, Cl. 404-84.000.

Miller, Gordon G., to United Technologies Corporation. Helicopter gimbal rotor. 4,566,856, Cl. 416-134.00A.

Miller, Jule A.; Lee, Jack W.; and Thyssen, Jeffrey, to Avco Corporation. Surface preparation of nickel base alloys for brazing. 4,566,939, Cl. 156-655.000.

Miller, Robert G.: *See—*
Schwartz, Victor M.; and Miller, Robert G., 4,566,818, Cl. 403-172.000.

Miller, Stephen J.; and Pandey, Sue D., to Chevron Research Company. Process for producing alkylbenzenes. 4,567,312, Cl. 585-419.000.

Miller, William M.: *See—*
Hoffman, Lawrence A.; Hacker, Jay P.; and Miller, William M., 4,566,552, Cl. 180-69.210.

Mimura, Yoshiki; Arai, Tetsuji; and Fukuda, Satoru, to Ushio Denki Kabushiki Kaisha. Flashlight-radiant apparatus. 4,567,352, Cl. 219-405.000.

Minagawa, Shoichi: *See—*
Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, 4,567,392, Cl. 310-313.00A.
Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, 4,567,393, Cl. 310-313.00A.

Miner Enterprises: *See—*
Anderson, David G., 4,566,678, Cl. 267-141.100.

Minicilli, Jean, to U.S. Philips Corporation. Method and apparatus for the stepwise static testing of the respective connections and integrated subsystems of a microprocessor-based system for use by the general public. 4,567,592, Cl. 371-20.000.

Minier, Jean; Barthelemy, Herve ; and Foglia, Vincent, to Commissariat a l'Energie Atomique. System for drilling from a water surface, which is insensitive to the swell. 4,566,824, Cl. 405-202.000.

Miniet, Jay J., to Motorola, Inc. Double-sided flexible electronic circuit module. 4,567,543, Cl. 361-398.000.

Ministry of International Trade & Industry: *See—*
Hayashi, Yutaka; Hamaguchi, Iwao; and Kobayashi, Kiyohiko, 4,567,061, Cl. 427-93.000.

Minnesota Mining and Manufacturing Company: *See—*
Howells, Richard D., 4,566,981, Cl. 252-8.800.
Isbrandt, Russell R.; and Young, Chung I., 4,567,133, Cl. 430-348.000.
Johnson, Gilbert C.; and Landin, Heather V., 4,567,237, Cl. 525-170.000.
Larson, James M.; and Noreen, Allen L., 4,567,073, Cl. 428-40.000.

Miotto, Mirella: *See—*
Holzle, Gerd; Miotto, Mirella; Reinert, Gerhard; and Polony, Rudolf, 4,566,874, Cl. 8-103.000.

Mirsberger, Helmut; and Popp, Franz, to Hilti Aktiengesellschaft. Sleeve-shaped expansion dowel. 4,566,832, Cl. 411-21.000.

Misawa, Makoto; Mizoguchi, Tetsuya; Kawakami, Kinya; and Ahagon, Asahiro, to Yokohama Rubber Co., Ltd., The. Rubber composition for tire treads. 4,567,225, Cl. 524-526.000.

Misawa, Rintaro, to Sunwa Sharyo Manufacturing Co., Ltd. Stair-climbing wheelchair carrier. 4,566,550, Cl. 180-8.200.

Mita Industrial Co., Ltd.: *See—*
Kajita, Hiroshi; and Nakajima, Tadanobu, 4,566,780, Cl. 355-3.00R.
Nakatani, Kaname; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; and Nakagama, Syoji, 4,566,908, Cl. 106-308.00N.

Mitsubishi Chemical Industries Limited: *See—*
Murao, Yoshikazu; Sawayama, Shigeru; and Satoh, Kohichi, 4,567,300, Cl. 564-215.000.

Mitsubishi Denki K.K.: *See—*
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, 4,567,455, Cl. 335-16.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Araya, Shinji; and Tsuji, Shintaro, 4,567,566, Cl. 364-554.000.
Arimoto, Satomi; Hirakawa, Hiroyuki; and Maekawa, Hiroshi, 4,567,538, Cl. 361-58.000.
Demizu, Akira, 4,566,410, Cl. 123-179.0BG.
Kobayashi, Toyohiro; Mochizuki, Shoji; Murata, Mitsuru; Tsuboi, Shunji; and Sakurai, Hideto, 4,566,813, Cl. 400-120.000.
Mitsuhashi, Masamichi, 4,567,408, Cl. 318-317.000.
Suzuki, Katsuhiko; and Honda, Takenobu, 4,566,562, Cl. 187-22.000.
Umeda, Yasukazu; and Takabe, Katsunori, 4,567,558, Cl. 364-148.000.
Watanabe, Eiki, 4,567,419, Cl. 318-798.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Ishihara, Takao, 4,566,392, Cl. 110-165.00R.

Mitsubishi Mining & Cement Company, Ltd.: *See—*
Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, 4,567,403, Cl. 315-47.000.

Mitsubishi Monsanto Chemical Company: *See—*
Tomono, Hiromi; Kokubo, Takashi; Yamaguchi, Kazuki; and Ikuma, Sadao, 4,567,233, Cl. 525-71.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Emoto, Kazuhiro; and Haino, Kozo, 4,567,126, Cl. 430-59.000.
Kagota, Nobuhiro, 4,566,907, Cl. 106-21.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, 4,567,089, Cl. 428-213.000.
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.

Mitsubishi Rayon Co., Ltd.: *See—*
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.

Mitsubishi Yuka Fine Chemical Co.: *See—*
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.

Mitsuhashi, Masamichi, to Mitsubishi Denki Kabushiki Kaisha. Digitally controlled rectifying system for driving a motor. 4,567,408, Cl. 318-317.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Sasaki, Masahiko; Watanabe, Kenji; and Kitamura, Seiichi, 4,566,398, Cl. 114-293.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,566,897, Cl. 71-88.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Ishii, Munenori, 4,566,201, Cl. 33-172.00E.

Miura, Shinichi: *See—*
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.

Miutel, Alexander: *See—*
Joseph, Ady; Mayer, Lily; and Miutel, Alexander, 4,566,992, Cl. 252-518.000.

Miwa, Akihiko: *See—*
Komorizono, Junichi; and Miwa, Akihiko, 4,566,276, Cl. 60-585.000.

Miwa, Hirohide: *See—*
Sato, Takuso; Ichida, Nobuyuki; and Miwa, Hirohide, 4,566,460, Cl. 128-660.000.

Miya, Yoji: *See—*
Sano, Takashi; Kawabata, Kazuo; and Miya, Yoji, 4,567,106, Cl. 428-413.000.

Miyagi, Masahiro; Uehara, Katsuharu; Nozawa, Yoshio; and Deguchi, Takahiko, to Hitachi, Ltd. Method of stacking fins of heat exchangers. 4,566,359, Cl. 83-23.000.

Miyakawa, Nobuhiro: *See—*
Nakatani, Kaname; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; and Nakagama, Syoji, 4,566,908, Cl. 106-308.00N.

Miyake, Kazutoshi: *See—*
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.

Miyamoto, Issei; and Kato, Yuichi, to Ohi Seisakusho Co., Ltd. Lever assembly. 4,566,350, Cl. 74-526.000.

Miyamoto, Yoshimi: *See—*
Yoshida, Ryuichi; Suzuki, Shigeru; Koishikawa, Hirotoshi; Miyamoto, Yoshimi; and Kawai, Kazuhide, 4,566,751, Cl. 339-218.00S.

Miyata, Tsutomu: *See—*
Ohmura, Kenji; Miyata, Tsutomu; Yamashita, Yoshihiro; and Noda, Minoru, 4,566,841, Cl. 414-417.000.

Miyatake, Kiyoshi, to Koyo Seiko Company Limited. Overrunning roller clutch. 4,566,567, Cl. 192-45.000.

Miyauchi, Tateoki; Hongo, Mikio; Mizukoshi, Katsuro; Yamaguchi, Hiroshi; and Shimase, Akira, to Hitachi, Ltd. Apparatus for summing several ring-shape laser beams. 4,566,765, Cl. 350-619.000.

Miyazaki, Tsutomu; Fukuda, Tatemi; and Yoshimine, Kazuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Device for storage of empty bobbins for a spinning frame. 4,566,263, Cl. 57-276.000.

Miyoshi, Takahito; Okutu, Toshimitu; Utumi, Masahiro; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Process for producing magnetic recording media. 4,567,063, Cl. 427-128.000.

Miyoshi, Takahito: *See*—
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.

Mize, Dean N.: *See*—
Buol, Douglas A.; Mize, Dean N.; Pattschull, John W.; and Wallace, Robert M., 4,567,432, Cl. 324-158.00F.

Mizoguchi, Shoichi, to NEC Corporation. Automatic adaptive equalizer having improved reset function. 4,567,599, Cl. 375-14.000.

Mizoguchi, Tetsuya: *See*—
Misawa, Makoto; Mizoguchi, Tetsuya; Kawakami, Kinya; and Ahagon, Asahiro, 4,567,225, Cl. 524-526.000.

Mizui, Takashi: *See*—
Sawa, Natsuo; Masuda, Takeshi; and Mizui, Takashi, 4,567,259, Cl. 544-207.000.

Mizukoshi, Katsuro: *See*—
Miyauchi, Tateoki; Hongo, Mikio; Mizukoshi, Katsuro; Yamaguchi, Hiroshi; and Shimase, Akira, 4,566,765, Cl. 350-619.000.

Mizuno, Yukio; and Sugimoto, Keiichi, to Takeda Chemical Industries, Ltd. Method of producing (S)-glyceraldehyde acetonide. 4,567,282, Cl. 549-450.000.

Mizutani, Hidemasa: *See*—
Ohtaka, Keiji; Suzuki, Takashi; Iizuka, Kiyoshi; and Mizutani, Hidemasa, 4,567,123, Cl. 430-4.000.

Mizutani, Uichiro: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Takahashi, Yoshimi; Hoshi, Akira; and Mizutani, Uichiro, 4,566,323, Cl. 73-295.000.

Mobil Oil Company: *See*—
Horodysky, Andrew G., 4,566,879, Cl. 44-71.000.

Mobil Oil Corporation: *See*—
Holmes, Billy G., 4,566,536, Cl. 166-251.000.
Rodewald, Paul G., 4,567,310, Cl. 585-408.000.

Mobley, Joseph G., to Scientific-Atlanta, Inc. Descrambler for sync-suppressed TV signals. 4,567,517, Cl. 358-120.000.

Mochida, Haruo: *See*—
Moriya, Masaichi; Mochida, Haruo; and Takeda, Yoshimitsu, 4,566,576, Cl. 192-84.00C.

Mochizuki, Shoji: *See*—
Kobayashi, Toyohiro; Mochizuki, Shoji; Murata, Mitsuru; Tsuboi, Shunji; and Sakurai, Hideto, 4,566,813, Cl. 400-120.000.

Modat, Bernard, to Renault Vehicules Industriels. Device for connecting a tractor to a semitrailer. 4,566,716, Cl. 280-439.000.

Moe, Per H. Method for diffusion welding. 4,566,625, Cl. 228-265.000.

Moffett, Richard C., to Honeywell Information Systems, Inc. Memory control for refreshing in a step mode. 4,567,571, Cl. 364-900.000.

Mohnach, Michael G.: *See*—
Baerenwald, Philip M.; Mohnach, Michael G.; and Plisky, John J., 4,566,147, Cl. 15-250.420.

Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for the electrochemical roughening of aluminum useful for printing plate supports, in an aqueous mixed electrolyte. 4,566,959, Cl. 204-129.750.

Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for electrochemical roughening of aluminum useful for printing plate supports, in an aqueous mixed electrolyte. 4,566,960, Cl. 204-129.750.

Moldovan, Anton G.; and McCoy, Randall E., to RCA Corporation. Lapping apparatus. 4,566,224, Cl. 51-56.00R.

Moller, Rudolf: *See*—
Braunsfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,566,196, Cl. 33-125.00R.

Mominee, David E.: *See*—
Menzel, Stanley W. O.; Mominee, David E.; and Vance, Gilbert W., 4,566,496, Cl. 138-154.000.

Monica, Thomas A. Actuation for spring mounted hobby horse. 4,566,688, Cl. 272-53.100.

Monie, Jean, to Societe Industrielle de Bellevaux, SIBEL. Cam operated control device of an electrical switch. 4,567,339, Cl. 200-153.0LB.

Monsanto Company: *See*—
Alt, Gerhard H.; and Bannon, James S., 4,567,299, Cl. 564-214.000.
Monzyk, Bruce F.; and Henn, Arthur R., 4,567,284, Cl. 556-37.000.
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,567,158, Cl. 502-209.000.

Montage Aktiebolag: *See*—
Skogman, Bengt G.; Svensson, Hans T.; and Torres, Eduardo E., 4,567,088, Cl. 428-213.000.

Monten, Gordon A. Water vessel leak detector and method of detecting leaks. 4,566,313, Cl. 73-40.700.

Monzyk, Bruce F.; and Henn, Arthur R., to Monsanto Company. Cobalt complex of N-alkylalkanohydroxamic acid. 4,567,284, Cl. 556-37.000.

Moore, Carl O., to A. E. Staley Manufacturing Company. Extruded confections. 4,567,055, Cl. 426-578.000.

Moore, David N., to Phoenix Closures, Inc. Linerless closure. 4,566,603, Cl. 215-329.000.

Moore, Kenneth P., to Xerox Corporation. Sheet feeding apparatus and valve therefor. 4,566,683, Cl. 271-98.000.

Moorehead, Eric L.: *See*—
Robinson, Paul R.; and Moorehead, Eric L., 4,567,314, Cl. 585-621.000.

Moors, Petrus M. A. W.; and Uittenbogaard, Teunis H., to U.S. Philips Corporation. Method of manufacturing transistors. 4,566,176, Cl. 29-578.000.

Morantz, Daniel J.: *See*—
Baldry, Peter J.; Collins, John H.; Morantz, Daniel J.; Overton, Terence K. W.; and Wright, David W., 4,567,122, Cl. 430-4.000.

Moraw, Roland: *See*—
Schwierz, Peter P.; Rebhan, Adolf; and Moraw, Roland, 4,566,783, Cl. 355-14.0FU.

Morbitzer, Leo: *See*—
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.

Morel, Claude: *See*—
Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, 4,567,177, Cl. 514-214.000.

Morgan, William C.; and Wagner, Richard A., Sr., to Wag-Mor Corporation. Camera carrying conduit inspection sled. 4,567,514, Cl. 358-100.000.

Moriguchi, Haruhiko; Inui, Toshiharu; Hisatake, Masayuki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Thermal head drive device. 4,567,488, Cl. 346-76.0PH.

Morihisa, Mitsuo; and Akao, Hideyuki, to Sharp Kabushiki Kaisha. Voltage level compensating interface circuit for inter-logic circuit data transmission system. 4,567,575, Cl. 364-900.000.

Morimoto, Yoshiro: *See*—
Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,566,354, Cl. 74-866.000.

Morinaga, Masaru, to NSK-Warner K.K. Emergency-locking type retractor provided with a take-up force locking mechanism. 4,566,650, Cl. 242-107.40A.

Morisaki, Minoru: *See*—
Hara, Kunio; Tanaka, Toshie; Shibayama, Teruji; Morisaki, Minoru; and Kaneko, Yoshio, 4,566,924, Cl. 156-73.500.

Morita, Michio: *See*—
Ooi, Kiyoshi; Morita, Michio; Suzuki, Kazuyoshi; Hashizume, Soh; and Yoshizawa, Hanako, 4,567,147, Cl. 435-237.000.

Moriya, Masaichi; Mochida, Haruo; and Takeda, Yoshimitsu, to Ohi Seisakusho Co., Ltd.; and Nissan Motor Co., Ltd. Reduction gear having a magnet clutch mechanism. 4,566,576, Cl. 192-84.00C.

Moroni, Wilko, to Hoechst Aktiengesellschaft. Electrophotographic recording material. 4,567,125, Cl. 430-58.000.

Morris, S. Brent; and Wisniewski, Richard A., to United States of America, National Security Agency. Fast parallel sorting processor. 4,567,572, Cl. 364-900.000.

Morris, Thomas K.: *See*—
Li, Hsin L.; Morris, Thomas K.; Seal, David B.; and Limoncelli, Edward V., 4,566,525, Cl. 164-463.000.

Moscovici, Armand: *See*—
Neuroth, David H.; and Moscovici, Armand, 4,567,320, Cl. 174-103.000.

Moscovici, Jean-Claude M.: *See*—
Brown de Colstoun, Francois P. D.; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; Moscovici, Jean-Claude M.; and Moscovici, Michel, 4,567,367, Cl. 250-340.000.

Moscovici, Michel: *See*—
Brown de Colstoun, Francois P. D.; Chambaret, Jean-Paul; Chambaret, Yves; Le Saige de la Villesbrunne, Arnaud G.; Moscovici, Jean-Claude M.; and Moscovici, Michel, 4,567,367, Cl. 250-340.000.

Moseley, John B., to Torrington Company, The. X-Y Position indicator for a display system. 4,566,191, Cl. 33-1.00M.

Moser, Rabin: *See*—
Henry, Arnold W.; and Moser, Rabin, 4,567,349, Cl. 219-216.000.

Mostek Corporation: *See*—
Van Tran, Hiep, 4,567,389, Cl. 307-530.000.

Motorola, Inc.: *See*—
Howell, William J.; and Hatchett, John D., 4,567,603, Cl. 375-65.000.
Jarrett, Robert B.; Main, W. Eric; and Neidorff, Robert A., 4,567,388, Cl. 307-540.000.
Main, William E., 4,567,441, Cl. 329-103.000.
Miniet, Jay J., 4,567,543, Cl. 361-398.000.
Stuhlmiller, Gary L., 4,567,384, Cl. 307-442.000.

Motrenec, Donald L. Steering stabilizer for vehicles. 4,566,712, Cl. 280-272.000.

Mountain, Peter J., to British Telecommunications. Three-to-two level digital signal conversions and vice versa. 4,567,601, Cl. 375-22.000.

Mourier, Georges, to Thomson-CSF. Electron beam injection device for an ultra-high frequency radio electric wave generator. 4,567,402, Cl. 315-39.300.

Moussy, Jacques L.; and Lescoeur, Jean A., to Compagnie Francaise des Petroles. Production tubes for use in the completion of an oil well. 4,566,541, Cl. 166-318.000.

Mouzin, Gilbert: *See*—
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,567,288, Cl. 560-37.000.

Moyer, Carl L.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.

Mueller Co.: *See*—
Leopold, Wilbur R., Jr.; and Humes, Dennis W., 4,566,481, Cl. 137-296.000.

Mueller, Herbert: *See*—
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.

Mueller, Martin, to Osgood Industries, Inc. Method and apparatus for preforming and applying a heat-shrinkable member to a container. 4,566,923, Cl. 156-69.000.

Mueller, Siegfried; and Schafer, Eberhard. Apparatus for applying a color medium to hair. 4,566,472, Cl. 132-112.000.

Mukai, Kosaku: *See*—
Ito, Giichi; Nakano, Ichizo; Shimizu, Yuichi; Mukai, Kosaku; and Suzuki, Saiju, 4,567,347, Cl. 219-124.340.

Muller, Gunter: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,567,230, Cl. 524-786.000.

Muller, Jurgen; and Ihm, Werner, to Agfa-Gevaert AG. Arrangement for removing photosensitive sheets from a container. 4,566,682, Cl. 271-90.000.

Muller, Peter: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,566,196, Cl. 33-125.00R.

Muller, Rainer; and Schiffers, Ulrich, to Kraftwerk Union Aktiengesellschaft. Power generating plant with an integrated coal gasification plant. 4,566,267, Cl. 60-39.070.

Muller, Rolf, to Mead Corporation, The. Carton formed from a plurality of packages. 4,566,593, Cl. 206-611.000.

Muller, Werner: *See*—
Clostermeyer, Gerhard; and Muller, Werner, 4,566,380, Cl. 100-89.000.

Mullin, John B.: *See*—
Irvine, Stuart J. C.; Mullin, John B.; and Giess, Jean, 4,566,918, Cl. 148-175.000.

Mumpower, Robert C.: *See*—
Henry, James W.; and Mumpower, Robert C., 4,567,372, Cl. 250-560.000.

Muramoto, Susumu: *See*—
Itsumi, Manabu; Ehara, Kohei; Muramoto, Susumu; and Matsuo, Seitaro, 4,566,940, Cl. 156-643.000.

Muramoto, Tomotaka: *See*—
Takayama, Makoto; Muramoto, Tomotaka; and Nishimura, Akimasa, 4,567,509, Cl. 358-29.000.

Murao, Yoshikazu; Sawayama, Shigeru; and Satoh, Kohichi, to Mitsubishi Chemical Industries Limited. Process for producing N-substituted formamides. 4,567,300, Cl. 564-215.000.

Murata Kikai Kabushiki Kaisha: *See*—
Kiriake, Masaharu, 4,566,644, Cl. 242-35.50A.
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,566,837, Cl. 414-222.000.

Murata Manufacturing Co., Ltd.: *See*—
Saito, Koji, 4,567,454, Cl. 333-206.000.

Murata, Mitsuru: *See*—
Kobayashi, Toyohiro; Mochizuki, Shoji; Murata, Mitsuru; Tsuboi, Shunji; and Sakurai, Hideto, 4,566,813, Cl. 400-120.000.

Murata, Takahiko: *See*—
Yamaguchi, Kazufumi; and Murata, Takahiko, 4,567,529, Cl. 358-294.000.

Murfin Incorporated: *See*—
Brainard, Ron P.; and Cassidy, L. Wayne, 4,567,072, Cl. 428-40.000.

Murphy, Donald M.: *See*—
Bazan, Alberto; and Murphy, Donald M., 4,566,867, Cl. 417-393.000.

Musashi Engineering Kabushiki Kaisha: *See*—
Kawano, Hikaru; and Sato, Koji, 4,566,244, Cl. 53-588.000.

Musgrove, Neil R., to James Hardie Industries Limited. Selective flush cistern. 4,566,140, Cl. 4-324.000.

Musser, John H.; and Chakraborty, Utpal R., to USV Pharmaceutical Corporation. Certain aryl or hetero-aryl derivatives of 1-hydroxy-pentane or 1-hydroxy-hexane which are useful for treating inflammation and allergies. 4,567,184, Cl. 514-277.000.

Muto, Goro. Filament-type trimming apparatus. 4,566,189, Cl. 30-276.000.

Naarmann, Herbert, to BASF Aktiengesellschaft. Preparation of finely divided electrically conductive pyrrole polymers. 4,566,955, Cl. 204-59.00R.

Naarmann, Herbert; Heckmann, Walter; Kohler, Gernot; and Simak, Petr, to BASF Aktiengesellschaft. Preparation of finely divided electrically conductive pyrrole polymers. 4,567,250, Cl. 528-423.000.

Nabika, Kouichi: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,566,837, Cl. 414-222.000.

Nabisco Brands, Inc.: *See*—
Lloyd, Norman E., 4,567,142, Cl. 435-94.000.

Nadai, Bela: *See*—
Kaffka, Karoly; Nadai, Bela; Czabaffy, Andras; and Horvath, Lorand, 4,566,797, Cl. 356-402.000.

Nagai, Koichi: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, 4,567,114, Cl. 428-480.000.

Nagano, Kyoichi; Naganuma, Hiroshi; Shinada, Koichi; Tamura, Motonori; and Soneda, Shigenobu, to Nippon Steel Corporation. Low-hydrogen, low-nitrogen, low-oxygen welding flux. 4,566,916, Cl. 148-26.000.

Naganuma, Hiroshi: *See*—
Nagano, Kyoichi; Naganuma, Hiroshi; Shinada, Koichi; Tamura, Motonori; and Soneda, Shigenobu, 4,566,916, Cl. 148-26.000.

Nagao, Taku: *See*—
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,567,175, Cl. 514-211.000.

Nagaoka, Naoko: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.

Nagato, Nobuyuki; Maki, Kenichiro; Uematsu, Tomoe; and Ishioka, Ryoji, to Showa Denko Kabushiki Kaisha. Process for production of allyl carboxylate. 4,567,292, Cl. 560-245.000.

Nagel, Karl: *See*—
Kalkhof, Bernd; and Nagel, Karl, 4,567,537, Cl. 361-18.000.

Nagel, Reimer. Bit for horses. 4,566,254, Cl. 54-8.000.

Nagel, Rolf: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,567,230, Cl. 524-786.000.

Nagumo, Masahide: *See*—
Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, 4,567,568, Cl. 364-761.000.

Nagura, Shigehiro: *See*—
Takamizawa, Minoru; Yamamoto, Akira; and Nagura, Shigehiro, 4,567,245, Cl. 526-279.000.

Nahas, Joseph J.: *See*—
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,567,325, Cl. 179-6.30R.

Naito, Takashi: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.

Naka, Hiromitsu, to Kabushiki Kaisha Naka Gijutsu Kenkyusho. Ceiling construction. 4,566,233, Cl. 52-208.000.

Nakagama, Syoji: *See*—
Nakatani, Kaname; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; and Nakagama, Syoji, 4,566,908, Cl. 106-308.00N.

Nakagawa, Akio; Utagawa, Tadashi; and Tsukakoshi, Tsuneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Planar type semiconductor device with a high breakdown voltage. 4,567,502, Cl. 357-53.000.

Nakagawa, Kazuyuki: *See*—
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, 4,567,187, Cl. 514-312.000.

Nakahira, Tomotake. Apparatus for turning a circular knit hose inside out and sectioning same into unit hoses. 4,566,615, Cl. 223-43.000.

Nakajima, Hiromichi: *See*—
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,567,175, Cl. 514-211.000.

Nakajima, Minoru: *See*—
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.

Nakajima, Tadanobu: *See*—
Kajita, Hiroshi; and Nakajima, Tadanobu, 4,566,780, Cl. 355-3.00R.

Nakamura, Takashi: *See*—
Kataoka, Shigehiro; Nakamura, Takashi; Yamaji, Nobuyuki; and Nasuno, Seiichi, 4,567,254, Cl. 536-27.000.

Nakamura, Takeshi: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, 4,567,374, Cl. 250-578.000.

Nakamura, Tetsuya: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.00[illegible]

Nakamura, Yoshinori: *See*—
Aoki, Daiichi; Nakamura, Yoshinori; and Orimoto, Hiroyuki, 4,567,224, Cl. 524-494.000.

Nakanishi, Kouichi: *See*—
Chubachi, Noriyoshi; Kushibiki, Junichi; and Nakanishi, Kouichi, 4,566,333, Cl. 73-642.000.

Nakano, Ichizo: *See*—
Ito, Giichi; Nakano, Ichizo; Shimizu, Yuichi; Mukai, Kosaku; and Suzuki, Saiju, 4,567,347, Cl. 219-124.340.

Nakao, Shinji: *See*—
Kano, Masaaki; Yamaji, Hiroshi; Nakao, Shinji; and Okumura, Katsuya, 4,567,364, Cl. 250-307.000.

Nakashima, Noriyuki: *See*—
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.

Nakasho, Tukayo: *See*—
Makino, Syozaburo; Yoshikawa, Keiji; and Nakasho, Tukayo, 4,566,163, Cl. 28-187.000.

Nakasone, Henry H.: *See*—
Jimerson, Bruce D.; and Nakasone, Henry H., 4,567,375, Cl. 307-98.000.

Nakatani, Kaname; Miyakawa, Nobuhiro; Higashiguchi, Teruaki; and Nakagama, Syoji, to Mita Industrial Company, Limited. Azoic pigments having a silica core. 4,566,908, Cl. 106-308.00N.

Nakayama, Yasunobu: *See*—
Sato, Yasuji; Yamamoto, Takao; Sano, Yoshikazu; and Nakayama, Yasunobu, 4,567,326, Cl. 179-90.00B.

Nalle, George S., Jr. Manufacture of helical nets. 4,567,011, Cl. 264-504.000.
Nanba, Isao: *See*—
Waniisi, Tetuya; Sato, Hiroshi; and Nanba, Isao, 4,566,803, Cl. 368-66.000.
Nanda, Madan M.: *See*—
Fredericks, Edward C.; Greenhaus, Herbert L.; Nanda, Madan M.; and Via, Giorgio G., 4,567,132, Cl. 430-312.000.
Nasse, Johannes: *See*—
Bochinski, Rolf; Eimer, Klaus; Littek, Harald; and Nasse, Johannes, 4,566,533, Cl. 165-95.000.
Nasuno, Seiichi: *See*—
Kataoka, Shigehiro; Nakamura, Takashi; Yamaji, Nobuyuki; and Nasuno, Seiichi, 4,567,254, Cl. 536-27.000.
National Computer Systems: *See*—
Gysling, Walter, 4,566,684, Cl. 271-117.000.
National Gypsum Company: *See*—
Schneller, Joseph W., 4,566,241, Cl. 52-481.000.
National Metal and Refining Company, Ltd.: *See*—
Matusik, Frank J.; and Nelson, Donald W., 4,566,181, Cl. 29-602.00R.
National Molding Corporation: *See*—
Anscher, Joseph; and Smous, Dale, 4,566,660, Cl. 248-74.200.
National Research Development Corporation: *See*—
Brewin, Nicholas J.; and Johnston, Andrew W. B., 4,567,146, Cl. 435-172.300.
Buckingham, Amyand D.; and Shelton, David P., 4,567,596, Cl. 372-22.000.
Smith, Kenneth C. A.; and Erasmus, Stephen J., 4,567,369, Cl. 250-397.000.
Naumann, Johannes: *See*—
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.
Nay, Barry; and Stewart, David G., to British Petroleum Company p.l.c., The. Catalyst composition for the production of alcohols from synthesis gas. 4,567,160, Cl. 502-326.000.
Naylor, Geoffrey, to Rieter-Scragg Limited. Textile processing apparatus. 4,566,265, Cl. 57-336.000.
Naylor, Jimmy R., to Burr-Brown Corporation. Circuit for improving the performance of digital to analog converters. 4,567,463, Cl. 340-347.0DA.
NEC Corporation: *See*—
Mizoguchi, Shoichi, 4,567,599, Cl. 375-14.000.
Shimada, Yuzo; Utsumi, Kazuaki; Ikeda, Teruyuki; and Suzuki, Masanori, 4,567,542, Cl. 361-321.000.
Neff, James A., to MAC Valves, Inc. Direct solenoid operated valve with minimal tolerance accumulation. 4,566,490, Cl. 137-625.650.
Nei Canada Limited: *See*—
Winrow, Donald; and Copeland, Kenneth G., 4,566,210, Cl. 40-649.000.
Neidleman, Saul L.; and Ervin, Jacqueline L., to Cetus Corporation. Method of producing long chain wax esters from ethanol. 4,567,144, Cl. 435-134.000.
Neidorff, Robert A.: *See*—
Jarrett, Robert B.; Main, W. Eric; and Neidorff, Robert A., 4,567,388, Cl. 307-540.000.
Nelson, Donald W.: *See*—
Matusik, Frank J.; and Nelson, Donald W., 4,566,181, Cl. 29-602.00R.
Nelson, Edward I.: *See*—
Ehrlich, Stephen J.; and Nelson, Edward I., 4,567,317, Cl. 174-35.0MS.
Nelson Irrigation Corporation: *See*—
Sesser, George L., 4,566,632, Cl. 239-230.000.
Nelson, Ronald J.; and Wilson, Randall B., to AT&T Bell Laboratories. Elimination of mask undercutting in the fabrication of InP/InGaAsP BH devices. 4,566,171, Cl. 29-569.00L.
Nepomuceno, Bienvenido: *See*—
Papp, John E.; and Nepomuceno, Bienvenido, 4,566,814, Cl. 400-354.100.
Neri, Paolo: *See*—
Tabacco, Alessandro; Tarli, Paolo; and Neri, Paolo, 4,567,150, Cl. 436-87.000.
Neste Oy: *See*—
Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, 4,567,255, Cl. 536-30.000.
Neumann, Peter, to Sandoz Ltd. Benzoxadiazoles and benzothiadiazoles. 4,567,271, Cl. 546-271.000.
Neumann, Peter: *See*—
Blinne, Gerd; Bender, Herbert; and Neumann, Peter, 4,567,248, Cl. 528-211.000.
Neumueller, Ronald L., to Ingersoll Cutting Tool Company. Ballnose end mill and insert therefor. 4,566,827, Cl. 407-42.000.
Neuroth, David H.; and Moscovici, Armand, to Harvey Hubbell Incorporated. Reinforced electrical cable and method of forming the cable. 4,567,320, Cl. 174-103.000.
Nevamar Corporation: *See*—
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., 4,567,087, Cl. 428-211.000.
Newall Engineering Company Limited, The: *See*—
Wheeler, Stanley G., 4,566,228, Cl. 51-238.00S.
Ng, Howard: *See*—
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,567,325, Cl. 179-6.30R.
NGK Insulators, Ltd.: *See*—
Ikushima, Kazuo; Itoh, Yoshio; and Ishihara, Toshiaki, 4,566,915, Cl. 148-11.50C.
Okamoto, Magoji; and Maekawa, Norio, 4,566,641, Cl. 241-200.000.
Nguyen, Gilbert H. K.: *See*—
Cohen, Serge; and Nguyen, Gilbert H. K., 4,566,310, Cl. 73-9.000.
Nicholson Manufacturing Company: *See*—
Jorgensen, Ray B.; and Ackerman, Robert T., 4,566,371, Cl. 92-92.000.
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., to Research Corporation. Leukotriene analogues. 4,567,290, Cl. 560-124.000.
Nicolet Instrument Corporation: *See*—
Boese, Roland, 4,566,283, Cl. 62-49.000.
Niderstatter, Walter: *See*—
Sprintschnik, Gerhard; Niderstatter, Walter; and Stroszynski, Joachim, 4,566,952, Cl. 204-27.000.
Niemeier, Byron M.: *See*—
Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., 4,566,656, Cl. 244-3.110.
Niemers, Ekkehard; Knorr, Andreas; and Garthoff, Bernward, to Bayer Aktiengesellschaft. Hypotensive 2-nitro-1,1-ethenediamines. 4,567,188, Cl. 514-332.000.
Nifco, Inc.: *See*—
Hara, Kunio; Tanaka, Toshie; Shibayama, Teruji; Morisaki, Minoru; and Kaneko, Yoshio, 4,566,924, Cl. 156-73.500.
Nihon Denshi Zairo Kabushiki Kaisha: *See*—
Ohkubo, Masao; and Yoshimitsu, Yasuro, 4,567,433, Cl. 324-158.00P.
Niitti, Timo U.: *See*—
Kivisto, Tuomo V. J.; Fallenius, Kai B.; and Niitti, Timo U., 4,566,968, Cl. 210-221.100.
Nikkiso Co., Ltd.: *See*—
Akiba, Takashi, 4,566,858, Cl. 417-22.000.
Nikulainen, Matti J., to Kone Oy. Drum press for separating liquid from solid substance. 4,566,381, Cl. 100-121.000.
Nilsen, Bjorn P.: *See*—
Blindheim, Ulf; Haegh, Gerd S.; and Nilsen, Bjorn P., 4,567,313, Cl. 585-480.000.
Ninomiya, Masakazu; Fujisawa, Hideya; Omori, Norio; and Suzuki, Atsushi, to Nippondenso Co., Ltd. Apparatus and method for controlling air-to-fuel ratio for an internal combustion engine. 4,566,419, Cl. 123-489.000.
Nipoti, Paolo: *See*—
Aiuola, Franco; and Nipoti, Paolo, 4,566,491, Cl. 137-625.660.
Nippon Colin Co., Ltd.: *See*—
Taniguchi, Satoru; Nishibayashi, Hideo; and Uemura, Masahiro, 4,566,463, Cl. 128-682.000.
Nippon Electric Co., Ltd.: *See*—
Noguchi, Shozo; Oshima, Yasunobu; and Kamata, Tohru, 4,567,598, Cl. 372-36.000.
Oshima, Goro; Ono, Satoru; and Shimada, Yasuhisa, 4,567,485, Cl. 343-358.000.
Nippon Electric Glass Company, Limited: *See*—
Kusakabe, Masayoshi, 4,566,895, Cl. 65-319.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Katoh, Mitsumi, 4,566,364, Cl. 84-1.190.
Nippon Kogaku K.K.: *See*—
Kato, Kinya, 4,566,762, Cl. 350-411.000.
Matsuura, Toshio; and Suwa, Kyoichi, 4,566,795, Cl. 356-400.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Yamada, Takeo; Yamamoto, Tomohisa; Ando, Seigo; and Kawase, Yoshihiro, 4,567,435, Cl. 324-207.000.
Nippon Oil Co., Ltd.: *See*—
Hasegawa, Hiroshi; Shinzawa, Akira; and Kohno, Yoshiki, 4,566,994, Cl. 252-574.000.
Satoh, Hisatake; and Ota, Shinichi, 4,566,997, Cl. 260-105.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Akashi, Tamotsu; and Araki, Masatada, 4,566,905, Cl. 75-244.000.
Nippon Pneumatic Manufacturing Co., Ltd.: *See*—
Kotone, Yoshiharu; and Hiraoka, Masaaki, 4,566,675, Cl. 254-360.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Takei, Kenji; and Akabane, Yukihiro, 4,566,812, Cl. 384-484.000.
Nippon Selen Co., Ltd.: *See*—
Makino, Syozaburo; Yoshikawa, Keiji; and Nakasho, Tukayo, 4,566,163, Cl. 28-187.000.
Nippon Steel Corporation: *See*—
Nagano, Kyoichi; Naganuma, Hiroshi; Shinada, Koichi; Tamura, Motonori; and Soneda, Shigenobu, 4,566,916, Cl. 148-26.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Itsumi, Manabu; Ehara, Kohei; Muramoto, Susumu; and Matsuo, Seitaro, 4,566,940, Cl. 156-643.000.
Nippon Univac Supply Kaisha, Ltd.: *See*—
Shinoda, Morimasa; and Takahashi, Takamasa, 4,567,506, Cl. 358-11.000.
Nippondenso Co., Ltd.: *See*—
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.
Ninomiya, Masakazu; Fujisawa, Hideya; Omori, Norio; and Suzuki, Atsushi, 4,566,419, Cl. 123-489.000.
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.

Yamamoto, Yosizi; and Ishikawa, Toshio, 4,566,864, Cl. 417-353.000.
Nishibayashi, Hideo: *See—*
Taniguchi, Satoru; Nishibayashi, Hideo; and Uemura, Masahiro, 4,566,463, Cl. 128-682.000.
Nishibori, Setsuo; Komori, Hirohito; Saeki, Syuji; and Kinoshita, Hiromitsu, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Flame retarder for organic high molecular compounds prepared from polycondensates of halogenated phenols. 4,567,242, Cl. 525-534.000.
Nishida, Kenji: *See—*
Baba, Kiyokazu; Shirao, Shojiro; Nishida, Kenji; and Kiyosawa, Hiroshi, 4,566,834, Cl. 414-27.000.
Nishida, Koji: *See—*
Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, 4,567,089, Cl. 428-213.000.
Nishimatsu, Masaharu: *See—*
Arioka, Hiroyuki; Nishimatsu, Masaharu; and Watanabe, Akio, 4,567,083, Cl. 428-141.000.
Nishimura, Akimasa: *See—*
Takayama, Makoto; Muramoto, Tomotaka; and Nishimura, Akimasa, 4,567,509, Cl. 358-29.000.
Nishino, Fumio: *See—*
Honda, Haruhisa; Onoda, Shigeyoshi; and Nishino, Fumio, 4,566,777, Cl. 355-3.00R.
Nishino, Tadashi: *See—*
Nogami, Tadahiko; and Nishino, Tadashi, 4,566,954, Cl. 204-28.000.
Nishitsuji, Kazuichi; Aikawa, Eiichi; and Haraguchi, Yukio, to Kabushiki Kaisha Toshiba. Closed type compressor. 4,566,865, Cl. 417-363.000.
Nissan Motor Co., Ltd.: *See—*
Fujioka, Kazuyoshi, 4,566,571, Cl. 192-70.200.
Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,566,354, Cl. 74-866.000.
Moriya, Masaichi; Mochida, Haruo; and Takeda, Yoshimitsu, 4,566,576, Cl. 192-84.00C.
Ohashi, Toshio, 4,566,373, Cl. 98-2.010.
Sugano, Kazuhiko, 4,566,355, Cl. 74-869.000.
Suzuki, Kunihiko, 4,566,554, Cl. 180-249.000.
Tabata, Hiroshi; and Kai, Yasuaki, 4,567,082, Cl. 428-138.000.
Takeuchi, Kiyoshi, 4,566,316, Cl. 73-754.000.
Nitou, Hiroyasu; Shirai, Kiyoshi; and Takahashi, Osamu, to Kokusan Denki Co., Ltd. Ignition system of the condensor-discharge type for internal combustion engine. 4,566,425, Cl. 123-600.000.
Nitrotec Corporation: *See—*
Knoblauch, Karl; Harder, Burkhard; Heimbach, Heinrich; and Cosentino, Charles F., 4,566,282, Cl. 62-48.000.
Nitsch, Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Photographic roller copying apparatus with a device for threading a new paper tape. 4,566,784, Cl. 355-72.000.
Nitto Kohki Co., Ltd.: *See—*
Takeuchi, Hirosato; and Mikiya, Toshio, 4,566,431, Cl. 126-437.000.
Nitzberg, Leonard R. Wheel chair. 4,566,707, Cl. 180-8.200.
NL Industries, Inc.: *See—*
House, Roy F.; and Hoover, Lonnie D., 4,566,976, Cl. 252-8.50A.
Rao, M. Vikram; and Fontenot, John E., Jr., 4,566,318, Cl. 73-151.000.
Noda, Minoru: *See—*
Ohmura, Kenji; Miyata, Tsutomu; Yamashita, Yoshihiro; and Noda, Minoru, 4,566,841, Cl. 414-417.000.
Noel, Jean-Paul: *See—*
Al Mouhamed, Mayez; Csakvary, Etienne; De Cosnac, Bertrand; and Noel, Jean-Paul, 4,566,845, Cl. 414-735.000.
Nogami, Tadahiko; and Nishino, Tadashi, to Hitachi, Ltd. Method of and apparatus for split rolling of steel sheet. 4,566,954, Cl. 204-28.000.
Noguchi, Shozo; Oshima, Yasunobu; and Kamata, Tohru, to Nippon Electric Co., Ltd. Optoelectronic semiconductor devices in hermetically sealed packages. 4,567,598, Cl. 372-36.000.
Nohara, Akira; and Maki, Yoshitaka, to Takeda Chemical Industries, Ltd. Diphenoxypropane derivatives and compositions of antiasthmatic and antiinflammatory agents thereof. 4,567,201, Cl. 514-571.000.
Noji, Masahide: *See—*
Kidani, Yoshinori; and Noji, Masahide, 4,567,285, Cl. 556-137.000.
Noland, Lyle J.: *See—*
Bateman, Charles D.; Grove, Michael M.; Noland, Lyle J.; and Ward, Wallace E., 4,567,483, Cl. 340-970.000.
Norberg, Gustav S. I.; Segerstrom, Kjell E. L.; and Ahl, Tommy E., to Wenmec AB. Method for cleaning cathode or anode plates. 4,566,951, Cl. 204-12.000.
Nordlund, Sven, to Wm Regele AB. Fluid pressure actuator having position setting means. 4,566,670, Cl. 251-58.000.
Noreen, Allen L.: *See—*
Larson, James M.; and Noreen, Allen L., 4,567,073, Cl. 428-40.000.
Noritsu Kenkyu Center Co., Ltd.: *See—*
Takenouchi, Toru, 4,566,785, Cl. 355-72.000.
North American Philips Consumer Electronics Corp.: *See—*
Hiday, David R.; and Larsen, Charles G., 4,567,523, Cl. 358-191.100.
North American Philips Corporation: *See—*
Bowlin, Stanley L., 4,566,936, Cl. 156-627.000.
Northern Telecom Limited: *See—*
Garner, John N., 4,566,264, Cl. 57-314.000.
Norton Christensen, Inc.: *See—*
Story, Arthur L.; and Filshtinsky, Michael, 4,566,545, Cl. 175-226.000.
Norwood Marking & Equipment Co., Inc.: *See—*
Davison, Charles F., 4,566,386, Cl. 101-305.000.
Novak, Leo R.: *See—*
Kitchens, John D.; and Novak, Leo R., 4,567,241, Cl. 525-352.000.
Novello, Frederick C.: *See—*
Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., 4,567,289, Cl. 560-059.000.
Nozawa, Ryoichiro; Kinoshita, Mitsuo; and Matsumura, Teruyuki, to Fanuc Ltd. Method and apparatus for controlling direction reversal in electric discharge machines. 4,567,342, Cl. 219-69.00M.
Nozawa, Yoshio: *See—*
Miyagi, Masahiro; Uehara, Katsuharu; Nozawa, Yoshio; and Deguchi, Takahiko, 4,566,359, Cl. 83-23.000.
NSK-Warner K.K.: *See—*
Morinaga, Masaru, 4,566,650, Cl. 242-107.40A.
NTT Gijutsu Iten Kabushiki Kaisha: *See—*
Ito, Giichi; Nakano, Ichizo; Shimizu, Yuichi; Mukai, Kosaku; and Suzuki, Saiju, 4,567,347, Cl. 219-124.340.
Nugmanova, Lyalya T.: *See—*
Ljubman, Nazar Y.; Imangazieva, Gulsara K.; Nugmanova, Lyalya T.; Uskov, Alexandr I.; Sydykova, Tokhtobubu C.; and Kim, Zinaida I., 4,567,207, Cl. 521-35.000.
Numauchi, Hiromitsu: *See—*
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.
Nydahl, John E.: *See—*
Pell, Kynric M.; and Nydahl, John E., 4,566,527, Cl. 165-1.000.
Nyfeler, Robert, to Ciba-Geigy Corporation. 3-Phenyl-4-cyanopyrrole derivatives, the preparation thereof, and method of use thereof as microbicides. 4,567,052, Cl. 426-532.000.
Oberster, Arthur E.; and Vicic, John C., to Firestone Tire & Rubber Company, The. Naphthalenic derivatized plasticizers for polyphosphazene polymers. 4,567,211, Cl. 521-98.000.
O'Brien, Robert N.; McOrmond, Philip M.; Hocking, Martin B.; and Thornton, Kenneth R., to University of Victoria. Meter for measuring erythrocyte settling rates. 4,566,315, Cl. 73-61.400.
Obstfelder, Gunther; Kreutze, Gerhard; and Luttig, Winfried. Thermal printhead for thermographic printer. 4,567,489, Cl. 346-76.0PH.
Occidental Chemical Corporation: *See—*
Ilardo, Charles S., 4,567,214, Cl. 523-216.000.
Ochi, Masafumi: *See—*
Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, 4,567,403, Cl. 315-47.000.
Ochoa, Victor M.; and Pueyo, Ricardo, to Foret S.A. Production of hydrogen peroxide. 4,566,998, Cl. 260-369.000.
Octa, Inc.: *See—*
Tucker, Hartwell F.; Tucker, Jeffrey R.; Ross, Dennis; and Knirck, Jeffrey G., 4,567,391, Cl. 310-156.000.
O'Dell, Donald E., to Aqua-Chem, Inc. Method and means of manufacturing spirally fluted tubes. 4,566,301, Cl. 72-75.000.
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., to Nevamar Corporation. Scuff resistance in abrasion-resistant laminates. 4,567,087, Cl. 428-211.000.
O'Donnell & Associates, Inc.: *See—*
Secemski, Isaac I.; and Podgorsky, Joseph J., 4,566,993, Cl. 252-559.000.
Oellerer, Friedrich: *See—*
Theurer, Josef; and Oellerer, Friedrich, 4,566,389, Cl. 104-3.000.
Oertel, Richard W., III: *See—*
Goldwasser, David J.; and Oertel, Richard W., III, 4,567,236, Cl. 525-127.000.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See—*
Bernard, Alain M.; Le Clerc, Georges-Marie J.; and Foulon, Bernard M., 4,566,328, Cl. 73-517.00B.
Ogahara, Shunji: *See—*
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki. 4,567,472, Cl. 340-525.000.
Ogata, Yasuhiro; and Maekawa, Masakazu, to Fuji Photo Film Co., Ltd. Pressure-sensitive recording sheets. 4,567,496, Cl. 346-200.000.
Ogawa, Hiroshi: *See—*
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.
Ogawa, Masahiko, to Canon Kabushiki Kaisha. Control circuit for motor. 4,567,409, Cl. 318-327.000.
Ogawa, Toshio: *See—*
Umemura, Shinichiro; Katakura, Kageyoshi; and Ogawa, Toshio, 4,566,459, Cl. 128-660.000.
Ogden, Ralph, to Ajay Enterprises Corporation. Adjustable motor mount arrangement for exercise treadmills. 4,566,689, Cl. 272-69.000.
Oh-ishi, Tokuro: *See—*
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,567,175, Cl. 514-211.000.
O'Handley, Robert C., to Allied Corporation. Low magnetostriction amorphous metal alloys. 4,566,917, Cl. 148-31.550.
Ohashi, Ken: *See—*
Tawara, Yoshio; Ohashi, Ken; and Kikuchi, Hideaki, 4,567,576, Cl. 365-2.000.
Ohashi, Toshio, to Nissan Motor Co., Ltd. Ventilation arrangement for automotive vehicle or the like. 4,566,373, Cl. 98-2.010.

Ohashi, Yasuo: *See*—
Ban, Keisuke; and Ohashi, Yasuo, 4,566,519, Cl. 164-97.000.

Ohi Seisakusho Co., Ltd.: *See*—
Miyamoto, Issei; and Kato, Yuichi, 4,566,350, Cl. 74-526.000.
Moriya, Masaichi; Mochida, Haruo; and Takeda, Yoshimitsu, 4,566,576, Cl. 192-84.00C.

Ohigashi, Yoshiaki: *See*—
Matsumura, Wakuo; Kitazawa, Noboru; and Ohigashi, Yoshiaki, 4,566,250, Cl. 53-128.000.

Ohki, Koichiro: *See*—
Kitagawa, Yoshiaki; Ohki, Koichiro; and Sarada, Toshio, 4,567,351, Cl. 219-341.000.

Ohkubo, Masao; and Yoshimitsu, Yasuro, to Nihon Denshi Zairo Kabushiki Kaisha. Complex probe card for testing a semiconductor wafer. 4,567,433, Cl. 324-158.00P.

Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, to Daikin Kogyo Co., Ltd. Copolymers for optical fibers. 4,566,755, Cl. 350-96.340.

Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; Hisatake, Masayuki; and Ohmori, Takashi, 4,567,488, Cl. 346-76.0PH.

Ohmura, Kenji; Miyata, Tsutomu; Yamashita, Yoshihiro; and Noda, Minoru. Wafery works receiving or delivering device. 4,566,841, Cl. 414-417.000.

Ohno, Hideki: *See*—
Yuasa, Shigeki; Okabayashi, Minahiro; Ohno, Hideki; Suzuki, Katsumi; and Kusumoto, Koshi, 4,567,030, Cl. 423-326.000.

Ohno, Shigeru: *See*—
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,567,127, Cl. 430-65.000.

Ohnuki, Yukihiko: *See*—
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,567,127, Cl. 430-65.000.

Ohta, Hiroshi: *See*—
Goto, Eiichi; and Ohta, Hiroshi, 4,567,383, Cl. 307-415.000.

Ohta, Masafumi; Sasaki, Masaomi; and Shoshi, Masayuki, to Ricoh Co., Ltd. Electrophotographic element with trisazo photoconductor and an amine substituted charge transfer material. 4,567,124, Cl. 430-59.000.

Ohta, Satoshi: *See*—
Yamazaki, Yoshio; Takimoto, Masahiro; and Ohta, Satoshi, 4,567,217, Cl. 524-296.000.

Ohta Seiyaku Kabushiki Kaisha: *See*—
Kamano, Yoshiaki; Sugai, Saburo; Okazaki, Tokuji; Yoshida, Seiichiro; and Akaboshi, Sanya, 4,567,172, Cl. 514-179.000.

Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, to Iwasaki Electric Co., Ltd.; and Mitsubishi Mining & Cement Company, Ltd. High pressure discharge lamp with incorporated starter. 4,567,403, Cl. 315-47.000.

Ohtaka, Keiji; Suzuki, Takashi; Iizuka, Kiyoshi; and Mizutani, Hidemasa, to Canon Kabushiki Kaisha. Diffusing plate. 4,567,123, Cl. 430-4.000.

Ohtsu, Tadatoshi; and Yamahata, Takashi, to General Company Limited. Heat-sensitive transferring recording medium. 4,567,113, Cl. 428-480.000.

Ohya, Masaki; and Matsukura, Yoshihiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-resistant laminate film. 4,567,090, Cl. 428-214.000.

Ojiro, Yoshitaka: *See*—
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.

Okabayashi, Minahiro: *See*—
Yuasa, Shigeki; Okabayashi, Minahiro; Ohno, Hideki; Suzuki, Katsumi; and Kusumoto, Koshi, 4,567,030, Cl. 423-326.000.

Okamoto, Magoji; and Maekawa, Norio, to NGK Insulators, Ltd. Sheet breaking apparatus. 4,566,641, Cl. 241-200.000.

Okamoto, Takeshi: *See*—
Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, 4,567,392, Cl. 310-313.00A.
Asai, Ryuichi; Okamoto, Takeshi; and Minagawa, Shoichi, 4,567,393, Cl. 310-313.00A.

Okamoto, Tetsuhiko: *See*—
Tanino, Hiroshi; Okamoto, Tetsuhiko; and Ueyama, Shinichiro, 4,567,028, Cl. 423-300.000.

Okamoto, Yoshiyuki; and Hwang, Edward F., to W. R. Grace & Co. Poly(dipropargylamine) and derivatives thereof per se and p-doped and processes for preparing same. 4,567,298, Cl. 564-215.000.

Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,567,136, Cl. 435-4.000.

Okaniwa, Kenichiro: *See*—
Koyama, Mikio; and Okaniwa, Kenichiro, 4,567,024, Cl. 422-56.000.

Okanobu, Taiwa, to Sony Corporation. Current mirror circuit with control means for establishing an input-output current ratio. 4,567,444, Cl. 330-257.000.

Okaya, Takuji: *See*—
Maruyama, Hitoshi; Tanaka, Taku; and Okaya, Takuji, 4,567,221, Cl. 524-436.000.

Okazaki, Tokuji: *See*—
Kamano, Yoshiaki; Sugai, Saburo; Okazaki, Tokuji; Yoshida, Seiichiro; and Akaboshi, Sanya, 4,567,172, Cl. 514-179.000.

Okimoto, Haruo: *See*—
Tadokoro, Tomoo; Shiraishi, Hideo; and Okimoto, Haruo, 4,566,412, Cl. 123-216.000.
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,566,422, Cl. 123-559.000.

Okumura, Katsuya: *See*—
Kano, Masaaki; Yamaji, Hiroshi; Nakao, Shinji; and Okumura, Katsuya, 4,567,364, Cl. 250-307.000.

Okutu, Toshimitu: *See*—
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.
Miyoshi, Takahito; Okutu, Toshimitu; Utumi, Masahiro; and Fujiyama, Masaaki, 4,567,063, Cl. 427-128.000.

Olego, Diego; Brock, David G.; Baumann, John A.; and Spicer, William E., to Stauffer Chemical Company. MIS Device employing elemental pnictide or polyphosphide insulating layers. 4,567,503, Cl. 357-54.000.

Oliff, James R.: *See*—
Wood, Prentice J.; Oliff, James R.; and Watkins, Richard K., 4,566,626, Cl. 229-37.00R.

Olin Corporation: *See*—
Dodge, William B., 4,567,258, Cl. 544-192.000.
Miles, Ronald C., 4,566,950, Cl. 204-1.00T.

Oliver, Arthur B., to Texas Instruments Incorporated. Impedance modulated CMOS RAM cell. 4,567,577, Cl. 365-156.000.

Olmstead, William N., to Exxon Research & Engineering Company. Removal of nitrogen and sulfur from oil-shale. 4,566,965, Cl. 208-11.00R.

Olsen, Ronald H., to Microlife Technics, Inc. Plasmid vectors including Tn904. 4,567,141, Cl. 435-91.000.

Olympus Optical Co., Ltd.: *See*—
Inoue, Akira, 4,566,769, Cl. 354-145.100.
Sakagami, Toshio, 4,567,021, Cl. 422-102.000.
Yamaguchi, Tatuya, 4,566,437, Cl. 128-4.000.

O'Meara, Joseph D., Jr.; Yuan, Herbert H.; Lease, William O.; and Stapleton, Robert G., to Shell Oil Company. Centrifugal analyzer. 4,567,373, Cl. 250-573.000.

Omnet Associates: *See*—
Massey, James L.; and Omura, Jimmy K., 4,567,600, Cl. 375-2.100.

Omori, Norio: *See*—
Ninomiya, Masakazu; Fujisawa, Hideya; Omori, Norio; and Suzuki, Atsushi, 4,566,419, Cl. 123-489.000.

Omron Tateisi Electronics Co.: *See*—
Waniisi, Tetuya; Sato, Hiroshi; and Nanba, Isao, 4,566,803, Cl. 368-66.000.

Omura, Jimmy K.: *See*—
Massey, James L.; and Omura, Jimmy K., 4,567,600, Cl. 375-2.100.

O'Neal, Andrew W. Energy saving head pressure control system. 4,566,288, Cl. 62-196.100.

Onishi, Tetsuo: *See*—
Matsushita, Ken; and Onishi, Tetsuo, 4,566,383, Cl. 101-121.000.

Ono, Satoru: *See*—
Oshima, Goro; Ono, Satoru; and Shimada, Yasuhisa, 4,567,485, Cl. 343-358.000.

Onoda, Shigeyoshi: *See*—
Honda, Haruhisa; Onoda, Shigeyoshi; and Nishino, Fumio, 4,566,777, Cl. 355-3.00R.

Onogi, Toshiro; Yoda, Kenichi; and Kitamura, Masahiko, to Matsushita Electric Works, Ltd. Sequence controlling apparatus. 4,567,556, Cl. 364-140.000.

Ooi, Kiyoshi; Morita, Michio; Suzuki, Kazuyoshi; Hashizume, Soh; and Yoshizawa, Hanako, to Chiba Prefectural Government. Attenuated smallpox vaccine strain. 4,567,147, Cl. 435-237.000.

Ookawa, Norio: *See*—
Akisada, Masahide; Ookawa, Norio; and Takamura, Yuji, 4,566,767, Cl. 354-76.000.

Openshaw, Ronald D., to Costain Petrocarbon Limited. Production of pure nitrogen. 4,566,887, Cl. 62-21.000.

Opresko, Stephen T., to RCA Corporation. CRT Comprising metallized glass beads for suppressing arcing therein. 4,567,400, Cl. 313-457.000.

Orendi, Roderich R.: *See*—
Ehm, Karl H.; and Orendi, Roderich R., 4,566,679, Cl. 269-23.000.

Orii, Masaru, to Yugengaisha Kyodogiken. Method and apparatus for feeding materials to be pressed. 4,566,306, Cl. 72-346.000.

Orimoto, Hiroyuki: *See*—
Aoki, Daiichi; Nakamura, Yoshinori; and Orimoto, Hiroyuki, 4,567,224, Cl. 524-494.000.

Orth, Winfried; and Fickert, Werner, to Rutgerswerke Aktiengesellschaft. Pyrrole containing 2-aminonitropyridine derivatives. 4,567,272, Cl. 546-281.000.

Osaki, Masaaki: *See*—
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, 4,567,187, Cl. 514-312.000.

Osgood Industries, Inc.: *See*—
Mueller, Martin, 4,566,923, Cl. 156-69.000.

Oshima, Goro; Ono, Satoru; and Shimada, Yasuhisa, to Nippon Electric Co., Ltd. Earth station transmission power control system for keeping an EIRP of down link signals constant irrespective of weather. 4,567,485, Cl. 343-358.000.

Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, to Jujo Paper Co., Ltd. Thermal dye-transfer type recording sheet. 4,567,114, Cl. 428-480.000.

Oshima, Yasunobu: *See*—
Noguchi, Shozo; Oshima, Yasunobu; and Kamata, Tohru, 4,567,598, Cl. 372-36.000.

Oshima, Yasushi, to Yamato Scale Company, Limited. Weighing hopper cleaning device. 4,566,549, Cl. 177-245.000.

Oskar Frech GmbH and Co.: *See*—
Fink, Roland; and Klingenstein, Walter, 4,566,522, Cl. 164-316.000.
Ostergaard, James R., Sr.: *See*—
Ostergaard, James R., II; and Donaldson, Dwight L., 4,566,732, Cl. 297-174.000.
Ostergaard, James R., II; and Donaldson, Dwight L., to Ostergaard, James R., Sr., a part interest. Adjustable wheelchair table. 4,566,732, Cl. 297-174.000.
Ota, Shigenori: *See*—
Inoue, Seijiro; and Ota, Shigenori, 4,567,046, Cl. 426-20.000.
Ota, Shinichi: *See*—
Satoh, Hisatske; and Ota, Shinichi, 4,566,997, Cl. 260-105.000.
Otis Elevator Company: *See*—
Reimann, Kurt; Ackermann, Bernd; Loeb, Ruediger; and Ruther, Claus, 4,567,411, Cl. 318-341.000.
Otis Engineering Corporation: *See*—
Deaton, Thomas M., 4,566,478, Cl. 137-112.000.
Otomo, Masao: *See*—
Shimada, Kenjiro; Otomo, Masao; Tomita, Fusao; and Ito, Shingo, 4,567,164, Cl. 514-33.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, 4,567,187, Cl. 514-312.000.
Otsuke Kagaku Yakuhin Kabushiki Kaisha: *See*—
Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, 4,566,996, Cl. 260-239.00A.
Ott, Gunther; Dobbelstein, Arnold; Geist, Michael; Schon, Georg; and Ahlers, Klaas, to BASF Farben Fasern AG. Water-dispersible binders based on modified epoxide/amine adducts, and their preparation and use. 4,566,963, Cl. 204-181.700.
Otterbein, Roy T., to Arvin Industries, Inc. Capillary fin media. 4,566,290, Cl. 62-304.000.
Outboard Marine Corporation: *See*—
Billingsley, Henry C.; and DuBois, Chester G., 4,566,424, Cl. 123-583.000.
Shebuski, Robert C., 4,566,520, Cl. 164-131.000.
Outokumpu Oy: *See*—
Kivisto, Tuomo V. J.; Fallenius, Kai B.; and Niitti, Timo U., 4,566,968, Cl. 210-221.100.
Over, William R.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.
Overbo, Gordon I. Captive column. 4,566,247, Cl. 52-732.000.
Overley, John P.: *See*—
Watson, Alan R.; and Overley, John P., 4,567,608, Cl. 381-122.000.
Overton, Terence K. W.: *See*—
Baldry, Peter J.; Collins, John H.; Morantz, Daniel J.; Overton, Terence K. W.; and Wright, David W., 4,567,122, Cl. 430-4.000.
Owaysi, Fathi A.; and Al-Ameeri, Rasheed S., to Kuwait Institute for Scientific Research. Process for purification of liquid paraffins. 4,567,315, Cl. 585-827.000.
Owens-Corning Fiberglas Corporation: *See*—
Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., 4,567,102, Cl. 428-391.000.
Owens-Illinois, Inc.: *See*—
Chang, Long F., 4,566,600, Cl. 215-1.00C.
Jabarin, Saleh A., 4,567,069, Cl. 428-35.000.
Ozaki, Norihiko: *See*—
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, 4,566,843, Cl. 414-680.000.
Ozari, Yehuda: *See*—
Gajria, Chandrasen; and Ozari, Yehuda, 4,567,246, Cl. 526-318.440.
Ozawa, Michihiro: *See*—
Enomoto, Masaki; and Ozawa, Michihiro, 4,567,018, Cl. 376-435.000.
Ozawa, Takashi: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, 4,567,374, Cl. 250-578.000.
P. J. Zweegers en Zonen Landbouwmachine Fabriek B.V.: *See*—
Quataert, Petrus M., 4,566,258, Cl. 56-370.000.
Paardekooper, Stephanus; and Pek, Johan J. B., to Shell Oil Company. Apparatus for gas/liquid separation. 4,566,883, Cl. 55-329.000.
Pacific Scientific Company: *See*—
Goldsmith, Herbert, 4,566,791, Cl. 356-246.000.
Packendorff, Sven E. Clip with sliding locking member. 4,566,157, Cl. 24-536.000.
Padco, Inc.: *See*—
Janssen, Robert I., 4,566,816, Cl. 401-219.000.
Pafford, Bernie J.; and Bertsch, Carl F., to Exxon Research and Engineering Co. Octane catalytic cracking process. 4,566,966, Cl. 208-113.000.
Paliwoda, Kenneth J.: *See*—
Smigel, Robert L.; and Paliwoda, Kenneth J., 4,566,239, Cl. 52-407.000.
Pandey, Sue D.: *See*—
Miller, Stephen J.; and Pandey, Sue D., 4,567,312, Cl. 585-419.000.
Pandeya, Prakash N.; and Chu, Tsuwei, to Carrier Corporation. Reversible multi-vane rotary compressor. 4,566,869, Cl. 418-15.000.
Pandrol Limited: *See*—
Brown, Trevor P., 4,566,631, Cl. 238-349.000.
Panoch, Hans J.; Feldmann, Rainer; Hinn, Hans; Brandt, Siegfried; and Haage, Hans-Jurgen, to Chemische Werke Huls Aktiengesellschaft. Heat sealing textiles with copolyamides. 4,566,931, Cl. 156-330.900.
Papp, John E.; and Nepomuceno, Bienvenido, to Standard Precision, Inc. Print head carriage assembly. 4,566,814, Cl. 400-354.100.
Parham, Allan M. Medical stopcock valve assembly. 4,566,480, Cl. 137-271.000.
Park, Chung P., to Dow Chemical Company, The. Foams of ionically associated blends of styrenic and ethylenic polymers. 4,567,209, Cl. 521-81.000.
Parmet, Lawrence S. Helmet cooler. 4,566,292, Cl. 62-457.000.
Parr, Jack E.: *See*—
Lewis, Edward L.; Parr, Jack E.; Fox, Mark A.; and Fuson, Robert L., 4,566,138, Cl. 623-22.000.
Paruzzolo, Giovanni: *See*—
Piai, Dino; Rigoni, Renzo; and Paruzzolo, Giovanni, 4,566,970, Cl. 210-409.000.
Pascal, Jean-Claude G.: *See*—
Kluge, Arthur F.; Clark, Robin D.; Strosberg, Arthur M.; Pascal, Jean-Claude G.; and Whiting, Roger, 4,567,264, Cl. 544-400.000.
Pass & Seymour, Inc.: *See*—
Ronemus, DeHertburn N.; and Tice, Victor M., 4,567,544, Cl. 361-399.000.
Patel, Pinakin; Dharia, Dilip; and Maru, Hansraj, to Energy Research Corporation. Fuel cell employing non-uniform catalyst. 4,567,117, Cl. 429-19.000.
Patel, Pravin P.; and Reddy, Chitranjan N., to Texas Instruments Incorporated. Dynamic memory with high speed nibble mode. 4,567,579, Cl. 365-189.000.
Patel, Thakorbhai P.: *See*—
Fellner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., 4,567,189, Cl. 514-338.000.
Paterson, Arthur R.: *See*—
Sibilia, John P.; Kim, Hyo-gun; and Paterson, Arthur R., 4,566,991, Cl. 252-512.000.
Pattschull, John W.: *See*—
Buol, Douglas A.; Mize, Dean N.; Pattschull, John W.; and Wallace, Robert M., 4,567,432, Cl. 324-158.00F.
Paust, Joachim: *See*—
Ernst, Hansgeorg; Schmidt, Wolfram; and Paust, Joachim, 4,567,261, Cl. 544-251.000.
Pavelka, Bozidar: *See*—
Bettinger, Guenter; Pfefferkorn, Dietmar; and Pavelka, Bozidar, 4,566,653, Cl. 242-199.000.
Pavinato, Albert: *See*—
Pazdej, Richard; and Pavinato, Albert, 4,566,877, Cl. 44-51.000.
Pawloski, Curtis H.: *See*—
Spisak, Anthony F.; Stefanovic, Sava; and Pawloski, Curtis H., 4,566,251, Cl. 53-167.000.
Payne, George B.; Soloway, Samuel B.; Powell, James E.; Roman, Steven A.; and Kollmeyer, Willy D., to Shell Oil Company. Intermediates for oxabicycloalkane herbicides. 4,567,283, Cl. 549-546.000.
Pazdej, Richard; and Pavinato, Albert, to Institut de Recherches de la Siderurgie Francaise. Carbon foam usable as blast-furnace fuel and method of making same. 4,566,877, Cl. 44-51.000.
Pease, Roger F.; Tuckerman, David B.; and Swanson, Richard M., to Leland Stanford Junior University, The Board of Trustees of the. Heat sink and method of attaching heat sink to a semiconductor integrated circuit and the like. 4,567,505, Cl. 357-81.000.
Pecha, Edward: *See*—
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Alcock, Philip, 4,566,503, Cl. 140-140.000.
Peche, Gerhard, to Siemens Aktiengesellschaft. Cup-shaped switch contact member for an electric vacuum switch. 4,567,338, Cl. 200-144.00B.
Peer, Thomas R., to Exxon Research and Engineering Co. Electronic control system for a linearly slanted print head. 4,567,570, Cl. 364-900.000.
Peers, Robert P., to Microdot Inc. Electrical connection system. 4,566,747, Cl. 339-74.00R.
Peet, Norton P.; and Sunder, Shyam, to Merrell Dow Pharmaceuticals Inc. 2-(Formylamino)-N-(1H-tetrazol-5-yl)benzamide and use as anti-allergics. 4,567,193, Cl. 514-381.000.
Peglion, Jean-Louis: *See*—
Malen, Charles; Peglion, Jean-Louis; Laubie, Michel; and Poignant, Jean-Claude, 4,567,181, Cl. 514-256.000.
Pek, Johan J. B.: *See*—
Paardekooper, Stephanus; and Pek, Johan J. B., 4,566,883, Cl. 55-329.000.
Pell, Kynric M.; and Nydahl, John E. Isothermal heat pipe system. 4,566,527, Cl. 165-1.000.
Peltret, Pierre H.: *See*—
French, Geoffrey R.; Peltret, Pierre H.; and Chalke, Brian J., 4,566,271, Cl. 60-286.000.
Pennington, Keith S.: *See*—
Afzali-Ardakani, Ali; Cohen, Mitchell S.; Pennington, Keith S.; and Sachdev, Krishna G., 4,567,490, Cl. 346-135.100.
Penton, Harold R.: *See*—
Pettigrew, F. Alexander; and Penton, Harold R., 4,567,229, Cl. 524-610.000.
Perlman, William. Coal seam fracing method. 4,566,539, Cl. 166-307.000.
Permut, Ronald, to Storage Technology Corporation. Tape drive having swing arm buffers and automatic threading. 4,566,652, Cl. 242-189.000.

Perseo, Giuseppe: *See—*
de Castiglione, Roberto ; Perseo, Giuseppe; Gigli, Mauro; and Hecht, Barbara, 4,567,162, Cl. 514-16.000.

Persson, Hans A. W. Ultrasonic detector device. 4,566,334, Cl. 73-649.000.

Petasis, Nicos A.: *See—*
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., 4,567,290, Cl. 560-124.000.

Petcher, Trevor J.: *See—*
Revesz, Laszlo ; and Petcher, Trevor J., 4,567,192, Cl. 514-369.000.

Peter, Dietmar, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Cooling arrangement for an automotive vehicle, especially a passenger car. 4,566,407, Cl. 123-41.480.

Petersen, Carl M., III, to Irvin Industries Inc. Conversion control for combination VSI and ALR retractor. 4,566,649, Cl. 242-107.40A.

Petersen, Hans C.; and Kyster, Erik, to Danfoss A/S. Hydraulic control apparatus for a servo-motor, particularly for vehicle steering. 4,566,272, Cl. 60-384.000.

Peterson, Elmer R., to Baker Oil Tools, Inc. Fail-safe one trip perforating and gravel pack system. 4,566,538, Cl. 166-278.000.

Peterson, Steven H.; and Phillips, D. Colin, to Westinghouse Electric Corp. Chemical separation method for uranium isotopes. 4,567,025, Cl. 204-157.200.

Petiet, Thomas J., to Great Lakes Chemical Corporation. Halogenated bisphenol A ether flame retardant for ABS polymers. 4,567,218, Cl. 524-373.000.

Petiteau, Maurice R. Automated tool manipulating structure with X-Y movement including a belt and pulley drive arrangement. 4,566,346, Cl. 74-89.220.

Petrillo, Edward W., Jr.: *See—*
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,567,166, Cl. 514-82.000.

Pettigrew, F. Alexander; and Penton, Harold R., to Ethyl Corporation. Aryloxy-alkoxy substituted polyphosphazenes. 4,567,229, Cl. 524-610.000.

Pfefferkorn, Dietmar: *See—*
Bettinger, Guenter; Pfefferkorn, Dietmar; and Pavelka, Bozidar, 4,566,653, Cl. 242-199.000.

Pfister, Gustav: *See—*
Bukowiecki, Stanislaw; Pfister, Gustav; Reis, Alfons; Troup, Alan P.; and Ulli, Hans-Peter, 4,567,475, Cl. 340-634.000.

Pfizer Inc.: *See—*
Gruetzmacher, Gordon D., 4,567,048, Cl. 426-250.000.
Lombardino, Joseph G., 4,567,179, Cl. 514-225.000.
Stong, Randel E.; and Walinsky, Stanley W., 4,566,978, Cl. 252-8.50C.

Pforte, Karl W., to Buro Patent AG. Code-resetting device for a car-type transporter. 4,566,390, Cl. 104-88.000.

Pfyl, Walter: *See—*
Dobsa, Josip; Mauchle, Peter; Pfyl, Walter; and Sadek, Kadry, 4,567,424, Cl. 323-210.000.

Phase Technology Corporation: *See—*
Hecht, William; and Reyes, Pablo, 4,566,178, Cl. 29-594.000.

Philip Morris Incorporated: *See—*
Semp, Bernard A.; and Teng, Daniel M., 4,566,469, Cl. 131-308.000.

Phillips, D. Colin: *See—*
Peterson, Steven H.; and Phillips, D. Colin, 4,567,025, Cl. 204-157.200.

Phillips Petroleum Company: *See—*
Aldag, Arthur W., Jr., 4,566,967, Cl. 208-135.000.
Banks, Robert L.; and Kukes, Simon G., 4,567,159, Cl. 502-219.000.
Kuhn, Milos J., 4,567,582, Cl. 367-56.000.
Latchum, John W., Jr., 4,567,340, Cl. 219-10.410.

Philpot, Van B. Serum thrombin time in clinical medicine. 4,567,137, Cl. 435-13.000.

Phoenix Closures, Inc.: *See—*
Moore, David N., 4,566,603, Cl. 215-329.000.

Photo Engineering International s.r.l.: *See—*
Signoretto, Roberto, 4,567,356, Cl. 235-375.000.

Piai, Dino; Rigoni, Renzo; and Paruzzolo, Giovanni, to Industrie Zanussi S.p.A. Washing machine filter. 4,566,970, Cl. 210-409.000.

Pisecki, Douglas S., to RCA Corporation. Bias network having one mode for producing a regulated output. 4,567,381, Cl. 307-296.00R.

Piccone, John N.: *See—*
Piccone, Vincent A.; Piccone, John N.; Piccone, Louis A.; LeVeen, Robert F.; and LeVeen, Eric G., 4,566,464, Cl. 128-732.000.

Piccone, Louis A.: *See—*
Piccone, Vincent A.; Piccone, John N.; Piccone, Louis A.; LeVeen, Robert F.; and LeVeen, Eric G., 4,566,464, Cl. 128-732.000.

Piccone, Vincent A.; Piccone, John N.; Piccone, Louis A.; LeVeen, Robert F.; and LeVeen, Eric G. Implantable epilepsy monitor apparatus. 4,566,464, Cl. 128-732.000.

Pickering, William: *See—*
Wiblin, Wayne T.; Melocik, Grant C.; Leskovec, Edward V.; and Pickering, William, 4,567,467, Cl. 340-347.00P.

Pickett, Teddy L.; and Cook, Gary R., to United States of America, Navy. Forced entry and ballistic resistant laminar structure. 4,567,100, Cl. 428-339.000.

Pieper, Fritz: *See—*
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.

Pierre Fabre S.A.: *See—*
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,567,288, Cl. 560-37.000.

Pietro Ismardi & C. S.p.A.: *See—*
Ponchiroli, Osvaldo, 4,567,163, Cl. 514-29.000.

Pietruszkiewicz, Adolph: *See—*
Baldwin, John J.; Pietruszkiewicz, Adolph; Bolhofer, William A.; and Lumma, William C., Jr., 4,567,191, Cl. 514-362.000.

Piltingsrud, Douglas H.; and Shen, John C. S. Hydrated alumina binder system. 4,567,096, Cl. 428-315.500.

Pine, Lloyd A., to Exxon Research and Engineering Co. Co-matrixed zeolite and p/alumina. 4,567,152, Cl. 502-64.000.

Piper Industries, Inc.: *See—*
Sousek, Eugene A., 4,566,256, Cl. 56-10.200.

Pitney Bowes Inc.: *See—*
Dolan, Donald T., 4,566,170, Cl. 29-569.00L.
Irvine, Robert; Roetter, Frank T.; and Stearns, Willis R., 4,566,685, Cl. 271-150.000.

Pittel, Horst: *See—*
Gey, Mathias; Grote, Jurgen; Pittel, Horst; Samol, Gerd W.; and Zelt, Rainer, 4,567,085, Cl. 428-163.000.

Pitts, John R., to United States of America, Energy. Electron beam enhanced surface modification for making highly resolved structures. 4,566,937, Cl. 156-628.000.

Pittway Corporation: *See—*
Acar, Mustafa, 4,567,471, Cl. 340-513.000.

Plantorgan Werk Heinrich G. E. Christensen KG: *See—*
Badewien, Reinhard, 4,566,451, Cl. 128-200.210.

Plastiflex Company International: *See—*
Finley, Richard O., 4,567,319, Cl. 174-47.000.

Plath, Jurgen: *See—*
Schnabel, Jurgen; and Plath, Jurgen, 4,566,925, Cl. 156-86.000.

Plath, Peter; Schirmer, Ulrich; Reissenweber, Gernot; Wuerzer, Bruno; and Retzlaff, Guenter, to BASF Aktiengesellschaft. Aniline derivatives and their use for controlling undesirable plant growth. 4,566,900, Cl. 71-100.000.

Platt, Ronald: *See—*
Bedford, Geoffrey R.; Brittain, David R.; and Platt, Ronald, 4,567,278, Cl. 548-309.000.

Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Process for electrochemical roughening of aluminum useful for printing plate supports, in an aqueous mixed electrolyte. 4,566,958, Cl. 204-129.750.

Plisky, John J.: *See—*
Baerenwald, Philip M.; Mohnach, Michael G.; and Plisky, John J., 4,566,147, Cl. 15-250.420.

Podgorsky, Joseph J.: *See—*
Secemski, Isaac I.; and Podgorsky, Joseph J., 4,566,993, Cl. 252-559.000.

Poignant, Jean-Claude: *See—*
Malen, Charles; Peglion, Jean-Louis; Laubie, Michel; and Poignant, Jean-Claude, 4,567,181, Cl. 514-256.000.

Pol, Kenneth J.: *See—*
Draper, Reed T.; and Pol, Kenneth J., 4,566,608, Cl. 221-229.000.

Polaroid Corporation: *See—*
Czumak, Frank M.; and Wright, Joseph H., 4,566,770, Cl. 354-276.000.
Sulesky, Donald J.; and Wright, Joseph H., 4,566,772, Cl. 354-303.000.
Wright, Joseph H., 4,566,771, Cl. 354-283.000.

Polis, Marjorie J.; and Husson, Alan L., to Westinghouse Electric Corp. Multiprocessor supervisory control for an elevator system. 4,567,560, Cl. 364-184.000.

Pollet, Jean-Claude; Armstrong, Gordon P.; and Flautt, Martin C., to Owens-Corning Fiberglas Corporation. Hot melt size. 4,567,102, Cl. 428-391.000.

Polony, Rudolf: *See—*
Holzle, Gerd; Miotto, Mirella; Reinert, Gerhard; and Polony, Rudolf, 4,566,874, Cl. 8-103.000.

Polytel Corp.: *See—*
Danish, Sherif; and Aiken, Hugh H., 4,567,469, Cl. 340-365.00S.

Pommer, Ernst-Heinrich: *See—*
Eicken, Karl; Scheib, Klaus; Theobald, Hans; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,567,263, Cl. 544-263.000.
Marx, Hans-Norbert; and Pommer, Ernst-Heinrich, 4,567,277, Cl. 548-306.000.

Pompei, Francesco; and Daya, Shiraz, to Exergen Corporation. Scanning radiation detector. 4,566,808, Cl. 374-124.000.

Ponchiroli, Osvaldo, to Pietro Ismardi & C. S.p.A. Salicyclic acid derivatives of N-acetylcysteine and pharmacological use thereof. 4,567,163, Cl. 514-29.000.

Pong, William: *See—*
Liese, Grover J.; and Pong, William, 4,566,438, Cl. 128-6.000.

Pons, Robert L.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,566,432, Cl. 126-438.000.

Popp, Franz: *See—*
Mirsberger, Helmut; and Popp, Franz, 4,566,832, Cl. 411-21.000.

Popp, Franz-Wolfgang; and Feuring, Kurt, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Container for transporting and storing nuclear reactor fuel elements. 4,567,014, Cl. 376-272.000.

Popsicle Industries, Inc.: *See—*
von Kreuter, Alan, 4,566,612, Cl. 222-309.000.

Posanski, Ulrich; Ghyczy, Miklos; Bauer, Kurt-Heinz; and Wendel, Armin, to A. Natterman & Cie GmbH. Liquid active ingredient

concentrates for preparation of microemulsions. 4,567,161, Cl. 514-23.000.

Poschinger, Udo. Gas container. 4,566,589, Cl. 206-0.600.

Potechin, James: *See—*
Correnti, Albert D.; and Potechin, James, 4,566,726, Cl. 294-64.300.

Potter, John: *See—*
Vensko, George; Carlin, Lawrence; Potter, John; and Smith, Allen R., 4,567,606, Cl. 381-43.000.

Pound, John A. Greenhouse structure element. 4,566,236, Cl. 52-222.000.

Powell, James E.: *See—*
Payne, George B.; Soloway, Samuel B.; Powell, James E.; Roman, Steven A.; and Kollmeyer, Willy D., 4,567,283, Cl. 549-546.000.

Powell, Robert F., to Amerex Corporation. Portable pressure gauge tester. 4,566,308, Cl. 73-4.00R.

PPG Industries, Inc.: *See—*
Briar, Thomas J.; and Retsch, William H., 4,566,891, Cl. 65-12.000.
Gaa, Peter C.; and Dana, David E., 4,567,228, Cl. 524-588.000.
Hostler, Jonathan E.; and Beaver, Richard P., 4,566,890, Cl. 65-12.000.
Schaefer, William L., 4,566,888, Cl. 65-1.000.

Preece, Bruce L.: *See—*
McFarland, Archie R.; and Preece, Bruce L., 4,566,640, Cl. 241-74.000.

Price, Frederick: *See—*
Goldman, Michael B.; and Price, Frederick, 4,566,720, Cl. 281-15.00R.

Prince, Ronald E.: *See—*
Aloi, Anthony J.; Brooks, George D.; and Prince, Ronald E., 4,566,580, Cl. 193-48.000.

Pringle, Ronald E.; and Eatwell, William D., to Camco, Incorporated. Hydraulically actuated control fluid communication nipple. 4,566,540, Cl. 166-317.000.

Procter & Gamble Company, The: *See—*
Bush, Rodney D., 4,566,984, Cl. 252-140.000.

Procyk, Frank J.: *See—*
Dumbri, Austin C.; and Procyk, Frank J., 4,567,581, Cl. 365-230.000.

Prodan, Kathleen A.: *See—*
Chorvat, Robert J.; Prodan, Kathleen A.; and Schulz, John A., 4,567,270, Cl. 546-183.000.

PT Components, Inc.: *See—*
Marshall, Jeffrey F., 4,566,574, Cl. 192-84.00C.

Pueyo, Ricardo: *See—*
Ochoa, Victor M.; and Pueyo, Ricardo, 4,566,998, Cl. 260-369.000.

Puidak, Heino: *See—*
Martin, Ralph E.; and Puidak, Heino, 4,567,410, Cl. 318-332.000.

Pullukat, Thomas J.; Hwang, Yu-Tang; and Dombro, Robert A., to Chemplex Company. Polymerization method. 4,567,243, Cl. 526-128.000.

Pundarika, Eshwarahalli S., to Texas Instruments Incorporated. Piezoelectric pressure transmitter for an internal combustion engine. 4,567,395, Cl. 310-338.000.

Quantachrome Corporation: *See—*
Lowell, Seymour, 4,566,326, Cl. 73-432.0PS.

Quaresima, Emma: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and deWitt, Paolo, 4,567,200, Cl. 514-547.000.

Quataert, Petrus M., to P. J. Zweegers en Zonen Landbouwmachine Fabriek B.V. Device for working crop lying on the ground. 4,566,258, Cl. 56-370.000.

Quest Corporation: *See—*
Livsey, Robert A., 4,567,429, Cl. 324-99.00D.

Qureshi, Shahid; and Gardner, Hugh C., to Union Carbide Corporation. Thermoplastic modified epoxy compositions. 4,567,216, Cl. 523-400.000.

Racal Data Communications Inc.: *See—*
de la Guardia, Mario; and Kao, Ming-Luh, 4,567,521, Cl. 358-150.000.

Raceu, Dumitru: *See—*
Fleming, William J.; and Raceu, Dumitru, 4,566,338, Cl. 73-862.360.

Radcliff, Frank T., to Combustion Engineering, Inc. Dual isotope method to radiograph structures in nuclear steam supply systems. 4,567,012, Cl. 376-245.000.

Radford, Kenneth C.; and Carlson, William G., to Westinghouse Electric Corp. Burnable neutron absorbers. 4,566,989, Cl. 252-478.000.

Radiation Equipment Company, Inc.: *See—*
Weber, William E., 4,566,789, Cl. 356-241.000.

Raffelson, Harold: *See—*
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,567,158, Cl. 502-209.000.

Raffield, William C.: *See—*
Cavanaugh, Glenn L.; and Raffield, William C., 4,566,397, Cl. 114-56.000.

Rambock, Josef: *See—*
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, 4,567,459, Cl. 340-58.000.

Randall, Thomas G. Ice fishing rig. 4,566,216, Cl. 43-17.000.

Rante, John. Hands-on inspection board for printed circuit cards. 4,566,325, Cl. 73-432.00R.

Rao, M. Vikram; and Fontenot, John E., Jr., to NL Industries, Inc. Method for optimizing the tripping velocity of a drill string. 4,566,318, Cl. 73-151.000.

Rattin, Luciano: *See—*
Coli, Giuseppe; and Rattin, Luciano, 4,566,779, Cl. 355-3.00R.

Rau, Jim L.: *See—*
Barker, Charles A.; and Rau, Jim L., 4,566,477, Cl. 137-101.000.

Rau, Karl; Kalk, Heinz; and Metzger, Gerhard, to VDO Adolf Schindling AG. Apparatus for electrically measuring the level of a liquid in a container, particularly in the gasoline tank of a vehicle. 4,566,322, Cl. 73-295.000.

Rauchwerger, George P. Liquid beverage dispenser. 4,566,507, Cl. 141-271.000.

Rausing, Hans A., to Tetra Pak International AB. Method of manufacturing packing container having tear-up opening arrangement. 4,566,928, Cl. 156-217.000.

Raver, Norman, to International Business Machines Corporation. Driver circuit for controlling signal rise and fall in field effect transistor processors. 4,567,378, Cl. 307-270.000.

Raychem Corporation: *See—*
Bloom, William G.; and Geschwind, Gary I., 4,566,183, Cl. 29-825.000.

Raymond, Theodore E.; Huggins, Thomas B.; and Vining, George E., to Westinghouse Electric Corp. Nuclear fuel pellet sintering boat loading system. 4,566,835, Cl. 414-53.000.

RCA Corporation: *See—*
Avery, Leslie R., 4,567,500, Cl. 357-38.000.
Goodman, Alvin M., 4,567,431, Cl. 324-158.00R.
Hertzler, Merle E., 4,566,848, Cl. 414-749.000.
Hopkins, Maxwell M.; and Miller, Arthur, 4,566,893, Cl. 65-69.000.
Levine, Peter A., 4,567,524, Cl. 358-213.000.
Moldovan, Anton G.; and McCoy, Randall E., 4,566,224, Cl. 51-56.00R.
Opresko, Stephen T., 4,567,400, Cl. 313-457.000.
Pinsecki, Douglas S., 4,567,381, Cl. 307-296.00R.
Wacyk, Ihor T., 4,567,387, Cl. 307-530.000.

Reap, James J., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,566,898, Cl. 71-93.000.

Rebhan, Adolf: *See—*
Schwierz, Peter P.; Rebhan, Adolf; and Moraw, Roland, 4,566,783, Cl. 355-14.0FU.

Recognition Equipment Incorporated: *See—*
Carr, William N., 4,567,430, Cl. 324-158.00D.

Reddy, Chitranjan N.: *See—*
Patel, Pravin P.; and Reddy, Chitranjan N., 4,567,579, Cl. 365-189.000.

Regelman, Dale F., to Upjohn Company, The. Amidinium salts. 4,567,257, Cl. 544-78.000.

Regina Corporation: *See—*
Fitzwater, Edwin, 4,566,149, Cl. 15-320.000.

Rehau Plastiks AG & Co.: *See—*
Weinberg, Ekkehard; and Hameister, Rolf, 4,567,068, Cl. 428-31.000.

Reimann, Hans; and Fuchs, Uwe, to Linde Aktiengesellschaft. Process and apparatus for the biological purification of wastewater. 4,566,971, Cl. 210-616.000.

Reimann, Kurt; Ackermann, Bernd; Loeb, Ruediger; and Ruther, Claus, to Otis Elevator Company. High frequency pulse width modulation. 4,567,411, Cl. 318-341.000.

Reinauer, Josef, to Gottlieb Guhring. Ball track milling cutter tool. 4,566,828, Cl. 407-48.000.

Reinert, Gerhard: *See—*
Holzle, Gerd; Miotto, Mirella; Reinert, Gerhard; and Polony, Rudolf, 4,566,874, Cl. 8-103.000.

Reis, Alfons: *See—*
Bukowiecki, Stanislaw; Pfister, Gustav; Reis, Alfons; Troup, Alan P.; and Ulli, Hans-Peter, 4,567,475, Cl. 340-634.000.

Reissenweber, Gernot: *See—*
Plath, Peter; Schirmer, Ulrich; Reissenweber, Gernot; Wuerzer, Bruno; and Retzlaff, Guenter, 4,566,900, Cl. 71-100.000.

Reist, Walter, to Ferag AG. Apparatus for forming a spiral-layered coiled stack from substantially two-dimensional flat structures continuously arriving in imbricated formation. 4,566,686, Cl. 271-201.000.

Reitz, Helmut: *See—*
Dreher, Ulrich; and Reitz, Helmut, 4,566,585, Cl. 198-624.000.

Reliance Incorporated: *See—*
Toshishige, Yoshinori, 4,566,662, Cl. 248-222.100.

Renault Vehicules Industriels: *See—*
Modat, Bernard, 4,566,716, Cl. 280-439.000.

Resch, Klaus: *See—*
Haberl, Karl; and Resch, Klaus, 4,566,391, Cl. 105-215.00R.

Research Corporation: *See—*
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., 4,567,290, Cl. 560-124.000.

Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. 2,3-Dibromo-pentafluoropropyl fluorosulfate. 4,567,003, Cl. 260-458.00F.

Retsch, William H.: *See—*
Briar, Thomas J.; and Retsch, William H., 4,566,891, Cl. 65-12.000.

Retzlaff, Guenter: *See—*
Plath, Peter; Schirmer, Ulrich; Reissenweber, Gernot; Wuerzer, Bruno; and Retzlaff, Guenter, 4,566,900, Cl. 71-100.000.

Revesz, Laszlo ; and Petcher, Trevor J., to Sandoz Ltd. Acylaminophenol derivatives. 4,567,192, Cl. 514-369.000.

Revlon, Inc.: *See—*
Ciaudelli, Joseph P., 4,567,037, Cl. 424-59.000.
Ciaudelli, Joseph P.; and Brand, Elizabeth, 4,567,038, Cl. 424-59.000.

Stadnick, Richard P.; and Schnetzinger, Richard W., 4,567,039, Cl. 132-70.000.
Revol, Jacques: *See—*
Catrain, Yves; Guerrier, Claude; and Revol, Jacques, 4,567,092, Cl. 428-246.000.
Rexroth Sigma: *See—*
Bessard, Michel, 4,566,492, Cl. 137-636.100.
Reyes, Pablo: *See—*
Hecht, William; and Reyes, Pablo, 4,566,178, Cl. 29-594.000.
Rheinmetall GmbH: *See—*
Bartolles, Rolf, 4,566,368, Cl. 89-26.000.
Bierwirth, Adolf P.; and Zielinski, Erich, 4,566,369, Cl. 89-45.000.
Rhodes, William T.: *See—*
Caulfield, Henry J.; and Rhodes, William T., 4,567,569, Cl. 364-845.000.
Rhone-Poulenc Agrochimie: *See—*
Ambrosi, Dominique; and de Reinach Hirtzbach, Francois, 4,566,899, Cl. 71-93.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Lepage, Jean-Luc; and Soula, Gerard, 4,567,286, Cl. 556-469.000.
Rich, Stanley R.: *See—*
Sachar, Kenneth S.; and Rich, Stanley R., 4,566,636, Cl. 239-698.000.
Richard, Christian, to Thomson-CSF. Process for the adaptative coding and the decoding of a television picture and devices for performing this process. 4,567,519, Cl. 358-135.000.
Richards Aerospace Research Corporation: *See—*
Cucuzza, Joseph R., 4,566,699, Cl. 244-12.200.
Richling, Wayne P.: *See—*
Hackleman, David E.; Adams, Richard F.; and Richling, Wayne P., 4,566,193, Cl. 33-1.00D.
Richter, Ekkehard; Knoblauch, Karl; Schlegel, Rolf; and Korbacher, Werner, to Bergwerksverband GmbH. Process and apparatus for producing oxygen with a low proportion of argon from air. 4,566,881, Cl. 55-25.000.
Richter, Karl E.: *See—*
Ebey, Edward; and Richter, Karl E., 4,566,674, Cl. 254-345.000.
Ricoh Company, Ltd.: *See—*
Kondoh, Shiroh, 4,566,776, Cl. 355-3.0DD.
Ohta, Masafumi; Sasaki, Masaomi; and Shoshi, Masayuki, 4,567,124, Cl. 430-59.000.
Yuasa, Kazuhiro; and Komada, Kenya, 4,567,495, Cl. 346-153.100.
Rider, Billie F., to Rockwell International Corporation. System and technique for bandwidth improvement in multifunction sensors. 4,566,327, Cl. 73-510.000.
Riebel, Hans-Jochem: *See—*
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,567,168, Cl. 514-89.000.
Riege, David H.: *See—*
Sell, William J.; Riege, David H.; and Marinkovich, Vincent A., 4,567,149, Cl. 436-513.000.
Rieter Machine Works: *See—*
Zuend, Marcel, 4,566,152, Cl. 19-81.000.
Rieter Machine Works Ltd.: *See—*
Sommer, Hans-Jorg; Lamparter, Hansruedi; and Wermelinger, Maurizio, 4,566,642, Cl. 242-18.00R.
Rieter-Scragg Limited: *See—*
Naylor, Geoffrey, 4,566,265, Cl. 57-336.000.
Rigoni, Renzo: *See—*
Piai, Dino; Rigoni, Renzo; and Paruzzolo, Giovanni, 4,566,970, Cl. 210-409.000.
Rikagaku Kenkyusho: *See—*
Goto, Eiichi; and Ohta, Hiroshi, 4,567,383, Cl. 307-415.000.
Riker Laboratories, Inc.: *See—*
Gerster, John F., 4,567,269, Cl. 546-167.000.
Riley, Brian, to Combustion Engineering, Inc. Process for preparing mixed metal oxides. 4,567,031, Cl. 423-593.000.
Rinehart, Stephen A.: *See—*
Britt, James E.; Laskowski, Kenneth W.; Sisson, Jeffrey L.; and Rinehart, Stephen A., 4,566,782, Cl. 355-14.0SH.
Rinkewich, Isaac. Long range sprinkler with controlled application rate. 4,566,633, Cl. 239-237.000.
Ripperger, Willi: *See—*
Dressel, Manfred; Eberle, Heinrich; Ripperger, Willi; Ruehenbeck, Wolfgang; and Zwick, Werner, 4,567,294, Cl. 562-555.000.
Ripple, Dale B.; and Smith, David W. Surgical instrument. 4,566,466, Cl. 128-781.000.
Rise, Leif. Containers and holders for use in securing such containers to belts. 4,566,616, Cl. 224-253.000.
Rivoli, Anthony L.: *See—*
Hankins, Kevin T.; and Rivoli, Anthony L., 4,566,192, Cl. 33-1.00B.
Rizk, Sidky D.; Hsieh, Harry W. S.; and Mazzeo, Michael P., to Essex Specialty Products, Inc. Acrylic resin having pendant silane groups thereon, and methods of making and using the same. 4,567,107, Cl. 428-425.500.
Roayaie, Emad: *See—*
Jorne, Jacob; Roayaie, Emad; and Shah, Atul, 4,567,120, Cl. 429-72.000.
Robert Bosch GmbH: *See—*
Bauer, Otto; Eberl, Lernhard; Geyer, Gerhard; and Straubel, Max, 4,566,421, Cl. 123-502.000.
Heiser, Joachim; and Weigle, Dieter, 4,566,274, Cl. 60-444.000.
Kalkhof, Bernd; and Nagel, Karl, 4,567,537, Cl. 361-18.000.
Kemmner, Ulrich, 4,566,866, Cl. 417-366.000.
Sieber, Albrecht, 4,566,414, Cl. 123-357.000.
Trachte, Dietrich, 4,566,635, Cl. 239-533.800.
van Belzen, David; Lotterbach, Gerhard; van Woudenberg, Jan F.; and Zucker, Udo, 4,566,309, Cl. 73-4.00R.
Roberts, Thomas J., Jr.: *See—*
Roberts, Timothy J.; Roberts, Thomas J., Jr.; Roberts, Thomas J., Sr.; and Marinier, Robert P., Jr., 4,566,142, Cl. 4-604.000.
Roberts, Thomas J., Sr.: *See—*
Roberts, Timothy J.; Roberts, Thomas J., Jr.; Roberts, Thomas J., Sr.; and Marinier, Robert P., Jr., 4,566,142, Cl. 4-604.000.
Roberts, Timothy J.; Roberts, Thomas J., Jr.; Roberts, Thomas J., Sr.; and Marinier, Robert P., Jr., to Hospital Therapy Products, Inc. Seat shower. 4,566,142, Cl. 4-604.000.
Robertson, Tommie E., to Continental Conveyor & Equipment Co., Inc., The. Pressure device for conveyor. 4,566,586, Cl. 198-628.000.
Robinson, James L. Sander attachment for rotary power saw. 4,566,511, Cl. 144-1.00F.
Robinson, Malcolm: *See—*
Charles, Isabel; and Robinson, Malcolm, 4,567,034, Cl. 424-5.000.
Robinson, Paul R.; and Moorehead, Eric L., to Union Oil Company of California. Process for producing diolefins. 4,567,314, Cl. 585-621.000.
Rocamat: *See—*
Marechal, Roger; and Jeantet, Lucien, 4,566,427, Cl. 125-16.00R.
Roche, Joseph R., to Hydril Company. Vent line system. 4,566,494, Cl. 137-872.000.
Rockwell International Corporation: *See—*
Breiholz, Arlen E., 4,567,486, Cl. 343-401.000.
Higgins, J. Aiden; and Walton, Emory R., Jr., 4,566,184, Cl. 29-840.000.
McDermott, Thomas C., 4,567,587, Cl. 370-13.000.
Rider, Billie F., 4,566,327, Cl. 73-510.000.
Skipor, Eugen, 4,566,351, Cl. 74-606.00R.
Rodal, Jose J. A.: *See—*
Ewald, James L.; and Rodal, Jose J. A., 4,566,945, Cl. 162-343.000.
Rodewald, Paul G., to Mobil Oil Corporation. Preparation of modified zeolites and their utilization. 4,567,310, Cl. 585-408.000.
Rodgers, Franklin, to Aktiengesellschaft Adolph Saurer. Apparatus for the constrained actuation of the clamping system of filling-yarn insertion devices in shuttleless weaving machines. 4,566,500, Cl. 139-446.000.
Roetter, Frank T.: *See—*
Irvine, Robert; Roetter, Frank T.; and Stearns, Willis R., 4,566,685, Cl. 271-150.000.
Rogers, J. David, to Amhil Enterprises Ltd. Lid for drinks container. 4,566,605, Cl. 220-90.200.
Rohr, William L., Jr. Ligament tensor and distal femoral resector guide. 4,566,448, Cl. 128-92.00H.
Rohrbacher, Herbert E., to Bergandi Manufacturing Co., Inc. Automatic end coating attachment for a chain link weaver. 4,566,501, Cl. 140-1.000.
Roland Corporation: *See—*
Kikumoto, Tadao, 4,566,362, Cl. 84-1.030.
Rolin, Oskar L. Device for scraping off liquid. 4,566,148, Cl. 15-257.050.
Roller, Hermann: *See—*
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.
Rolls-Royce Limited: *See—*
Ballard, John R.; Timmis, Peter H.; and Buller, Michael J., 4,566,270, Cl. 60-264.000.
Roman, Steven A.: *See—*
Payne, George B.; Soloway, Samuel B.; Powell, James E.; Roman, Steven A.; and Kollmeyer, Willy D., 4,567,283, Cl. 549-546.000.
Romberg, Felix B. Pedal actuated gate. 4,566,223, Cl. 49-264.000.
Ronemus, DeHertburn N.; and Tice, Victor M., to Pass & Seymour, Inc. Plug-in ground fault circuit interrupter module. 4,567,544, Cl. 361-399.000.
Rosdorfer, Joachim: *See—*
Kroeplien, Udo; and Rosdorfer, Joachim, 4,567,194, Cl. 514-400.000.
Rosenkranz, Otto: *See—*
Hone, Norbert; Horwege, Claus; and Rosenkranz, Otto, 4,566,871, Cl. 425-525.000.
Rosenthal, David, to GCA Corporation. Reticle bar code and method and apparatus for reading same. 4,567,361, Cl. 235-462.000.
Ross, Dennis: *See—*
Tucker, Hartwell F.; Tucker, Jeffrey R.; Ross, Dennis; and Knircck, Jeffrey G., 4,567,391, Cl. 310-156.000.
Ross Hill Controls Corporation: *See—*
Beck, William H., 4,567,420, Cl. 318-803.000.
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, to United States of America, Administrator, National Aeronautics and Space Administration. Perfluoro (Imidoylamidine) diamidines. 4,567,301, Cl. 564-243.000.
Roth, Eldon N. Method for processing meat products. 4,567,050, Cl. 426-417.000.
Roth, Kurt: *See—*
Buhler, Ulrich; Tappe, Horst; Bode, Albert; Hahnke, Manfred; and Roth, Kurt, 4,567,252, Cl. 534-882.000.
Rothmans of Pall Mall Canada Limited: *See—*
Brackmann, Warren A., 4,566,470, Cl. 131-312.000.
Rotte, Hermann J.; and Bogl, Emil, to Mannesmann Rexroth GmbH. Spool member of a multi-way-valve. 4,566,479, Cl. 137-312.000.
Rottmayr, Josef, to Assmann, Aloisius, a part interest. Mold for casting reinforced concrete panel assembly elements. 4,566,669, Cl. 249-160.000.

Roujon, Auguste. Wire saw for shaping granite and other stone. 4,566,428, Cl. 125-21.000.
Roussel Uclaf: *See*—
Delevallee , Francoise ; Deraedt, Roger; and Le Martret, Odile, 4,567,198, Cl. 514-513.000.
Roux, Jacques: *See*—
Foch, Henri; and Roux, Jacques, 4,567,553, Cl. 363-98.000.
Royal Plastic S.A.: *See*—
Marchesini, Sisto, 4,566,731, Cl. 297-45.000.
Ruehenbeck, Wolfgang: *See*—
Dressel, Manfred; Eberle, Heinrich; Ripperger, Willi; Ruehenbeck, Wolfgang; and Zwick, Werner, 4,567,294, Cl. 562-555.000.
Ruf, Walter; and Kelley, Robert G., to St. Regis Corporation. Packaging machine. 4,566,505, Cl. 141-83.000.
Ruhle, James L. Free-floating neutrally-buoyant reciprocating pump valve for abrasive fluids. 4,566,485, Cl. 137-375.000.
Ruhrkohle AG: *See*—
Seipenbusch, Jurgen; and Dohren, Hans, 4,566,880, Cl. 48-73.000.
Rush, James D.: *See*—
Beales, Keith J.; Day, Clive R.; Ainslie, Benjamin J.; and Rush, James D., 4,566,754, Cl. 350-96.300.
Ruta, Joseph W., to S&C Electric Company. Power supply for a circuit interrupter. 4,567,540, Cl. 361-93.000.
Ruter, Ewald, to E. Ruter GmbH. Collapsible construction assembly. 4,566,245, Cl. 52-645.000.
Rutgerswerke Aktiengesellschaft: *See*—
Orth, Winfried; and Fickert, Werner, 4,567,272, Cl. 546-281.000.
Ruther, Claus: *See*—
Reimann, Kurt; Ackermann, Bernd; Loeb, Ruediger; and Ruther, Claus, 4,567,411, Cl. 318-341.000.
Ryason, P. R.: *See*—
DeVires, Louis; and Ryason, P. R., 4,567,311, Cl. 585-415.000.
Rye, Grover W.: *See*—
Brandyberry, Dennis R.; and Rye, Grover W., 4,566,261, Cl. 57-212.000.
Rynearson, Fred L. Adjustable hanger. 4,566,665, Cl. 248-495.000.
S&C Electric Company: *See*—
Ruta, Joseph W., 4,567,540, Cl. 361-93.000.
S. Schmied & Co., elektrotechnische Bedarfsartikel en gros, ASM-Tableaubau: *See*—
Schmied, Samuel, 4,566,742, Cl. 312-257.0SK.
Saab-Scania Aktiebolag: *See*—
Eriksson, Leif K. S., 4,566,569, Cl. 192-53.00G.
Saade , Henry Y.; and Tindall, William N. J., to International Business Machines Corporation. Optimizing cobol object code instruction path length with respect to perform statements. 4,567,574, Cl. 364-900.000.
Saam, John C.: *See*—
Huebner, David J.; and Saam, John C., 4,567,231, Cl. 524-837.000.
Sachar, Kenneth S.; and Rich, Stanley R., to Micropure, Incorporated. Producing liquid droplets bearing electrical charges. 4,566,636, Cl. 239-698.000.
Sachdev, Krishna G.: *See*—
Afzali-Ardakani, Ali; Cohen, Mitchell S.; Pennington, Keith S.; and Sachdev, Krishna G., 4,567,490, Cl. 346-135.100.
Sachleben, Leroy R.; Korte, Kevin R.; Snyder, Daniel D.; and Allen, Terry L., to Brown & Williamson Tobacco Corporation. Process and system for making a blended tobacco product. 4,566,468, Cl. 131-297.000.
Sackner, Marvin A., to Key Pharmaceuticals, Inc. Endorphin blockage. 4,567,185, Cl. 514-282.000.
Sadakane, Kenichiro: *See*—
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, 4,566,843, Cl. 414-680.000.
Sadek, Kadry: *See*—
Dobsa, Josip; Mauchle, Peter; Pfyl, Walter; and Sadek, Kadry, 4,567,424, Cl. 323-210.000.
Saeki, Syuji: *See*—
Nishibori, Setsuo; Komori, Hirohito; Saeki, Syuji; and Kinoshita, Hiromitsu, 4,567,242, Cl. 525-534.000.
Sagami Chemical Research Center: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.
St. Regis Corporation: *See*—
Ruf, Walter; and Kelley, Robert G., 4,566,505, Cl. 141-83.000.
Saito, Keiji: *See*—
Koyama, Hiroshi; and Saito, Keiji, 4,566,299, Cl. 72-8.000.
Saito, Koji, to Murata Manufacturing Co., Ltd. Resonator device. 4,567,454, Cl. 333-206.000.
Saito, Norio: *See*—
Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, 4,566,996, Cl. 260-239.00A.
Saito, Yukio: *See*—
Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, 4,567,097, Cl. 428-317.700.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member comprising a hydrogenated or halogenated amorphous silicon and geranium layer. 4,567,127, Cl. 430-65.000.
Saitoh, Kuniyuki: *See*—
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,567,086, Cl. 428-166.000.
Sakagami, Toshio, to Olympus Optical Company Limited. U-Shaped reaction tube made of elastic material. 4,567,021, Cl. 422-102.000.
Sakai, Kazunori: *See*—
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.
Sakai, Tetsuro: *See*—
Kusakabe, Tetsuo; Sakai, Tetsuro; and Honda, Kazuhiko, 4,567,507, Cl. 358-11.000.
Sakamoto, Masahide; and Shida, Masami, to Hitachi, Ltd. Electronic control apparatus for internal combustion engine. 4,566,420, Cl. 123-489.000.
Sakane, Kazuo: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,567,275, Cl. 548-128.000.
Sakuma, Kuniharu; and Goto, Sumio, to Tokyo Juki Industrial Co., Ltd. Thread feed mechanism in sewing machine. 4,566,396, Cl. 112-302.000.
Sakurai, Hideto: *See*—
Kobayashi, Toyohiro; Mochizuki, Shoji; Murata, Mitsuru; Tsuboi, Shunji; and Sakurai, Hideto, 4,566,813, Cl. 400-120.000.
Salzman, Ronald N., to General Signal Corporation. Submersible mixer alignable in a horizontal or vertical mode. 4,566,801, Cl. 366-343.000.
Samol, Gerd W.: *See*—
Gey, Mathias; Grote, Jurgen; Pittel, Horst; Samol, Gerd W.; and Zelt, Rainer, 4,567,085, Cl. 428-163.000.
Samtec Company Limited: *See*—
Hattori, Takeo; and Sasakura, Tohru, 4,567,427, Cl. 324-64.000.
Sanders Associates, Inc.: *See*—
Baer, Ralph H.; and Allen, David, 4,567,532, Cl. 358-342.000.
Lawrence, James, 4,567,491, Cl. 346-136.000.
Sandoz Ltd.: *See*—
Neumann, Peter, 4,567,271, Cl. 546-271.000.
Revesz, Laszlo ; and Petcher, Trevor J., 4,567,192, Cl. 514-369.000.
Sandrock, Gary D.; and Snape, Edwin, to Ergenics, Inc. Reaction heat storage method for hydride tanks. 4,566,281, Cl. 62-48.000.
Sanford, Lawrence. Dual packer apparatus and method. 4,566,535, Cl. 166-113.000.
Sangamo Weston, Inc.: *See*—
Jerrim, John W., 4,567,588, Cl. 370-18.000.
Sanger, George F. Modular structure assemblies. 4,566,246, Cl. 52-648.000.
Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,566,709, Cl. 280-91.000.
Sano, Shoichi: *See*—
Furukawa, Yoshimi; and Sano, Shoichi, 4,566,710, Cl. 280-91.000.
Koizumi, Yusuke; Furukawa, Yoshimi; and Sano, Shoichi, 4,566,711, Cl. 280-91.000.
Sano, Takashi; Kawabata, Kazuo; and Miya, Yoji, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Method of forming a coating on polyolefin substrate. 4,567,106, Cl. 428-413.000.
Sano, Yoshikazu: *See*—
Sato, Yasuji; Yamamoto, Takao; Sano, Yoshikazu; and Nakayama, Yasunobu, 4,567,326, Cl. 179-90.00B.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Iwai, Tomio; and Torigai, Katsumi, 4,566,415, Cl. 123-361.000.
Santa Barbara Research Center: *See*—
Goodnough, Mark A., 4,567,363, Cl. 250-214.00A.
Sara, Raymond V., to Union Carbide Corporation. Carbonaceous articles having oxidation prohibitive coatings thereon. 4,567,103, Cl. 428-408.000.
Sarada, Toshio: *See*—
Kitagawa, Yoshiaki; Ohki, Koichiro; and Sarada, Toshio, 4,567,351, Cl. 219-341.000.
Sarasue, Hirotaka; and Tsubokawa, Yoshitoki, to Yoshida Kogyo K.K. Slide fastener. 4,566,156, Cl. 24-398.000.
Sartorius GmbH: *See*—
Sodler, Walter; Knothe, Erich; Maaz, Gunther; and Madge, Joachim, 4,566,548, Cl. 177-229.000.
Sasaki, Koji; and Koizumi, Junji, to Toyoda Gosei Co., Ltd. Polyamide-rubber blended composition. 4,567,235, Cl. 525-113.000.
Sasaki, Koji; and Koizumi, Junji, to Toyoda Gosei Co., Ltd. Polyamide-rubber blended composition. 4,567,238, Cl. 525-179.000.
Sasaki, Masahiko; Watanabe, Kenji; and Kitamura, Seiichi, to Mitsui Engineering & Shipbuilding Co., Ltd. Anchoring apparatus. 4,566,398, Cl. 114-293.000.
Sasaki, Masaomi: *See*—
Ohta, Masafumi; Sasaki, Masaomi; and Shoshi, Masayuki, 4,567,124, Cl. 430-59.000.
Sasaki, Yoshitaka, to Hitachi Metals, Ltd. Pressure fixing device. 4,566,778, Cl. 355-3.0FU.
Sasakura, Tohru: *See*—
Hattori, Takeo; and Sasakura, Tohru, 4,567,427, Cl. 324-64.000.
Sasaoka, Michio: *See*—
Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, 4,566,996, Cl. 260-239.00A.
Sasazawa, Kazuo: *See*—
Yamaoka, Nobutatsu; and Sasazawa, Kazuo, 4,567,059, Cl. 427-79.000.
Sasson, Sabar: *See*—
Simonovitch, Chaim; Hoffman, Theodor; and Sasson, Sabar, 4,566,995, Cl. 260-239.30B.
Sato, Akinori: *See*—
Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, 4,566,471, Cl. 131-317.000.

Sato, Chikara: *See*—
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, 4,566,843, Cl. 414-680.000.

Sato, Hiroshi: *See*—
Waniisi, Tetuya; Sato, Hiroshi; and Nanba, Isao, 4,566,803, Cl. 368-66.000.

Sato, Kiyomi: *See*—
Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, 4,566,471, Cl. 131-317.000.

Sato, Koji: *See*—
Kawano, Hikaru; and Sato, Koji, 4,566,244, Cl. 53-588.000.

Sato, Masaaki: *See*—
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.

Sato, Masayuki: *See*—
Maeda, Takashi; and Sato, Masayuki, 4,566,847, Cl. 414-744.00R.

Sato, Takuso; Ichida, Nobuyuki; and Miwa, Hirohide, to Fujitsu Limited. Measuring method and apparatus for non-linear parameter of acoustic medium and its application. 4,566,460, Cl. 128-660.000.

Sato, Yasuji; Yamamoto, Takao; Sano, Yoshikazu; and Nakayama, Yasunobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Telephone apparatus for selective operation in a normal and repertory dial mode. 4,567,326, Cl. 179-90.00B.

Satoh, Hisatake; and Ota, Shinichi, to Nippon Oil Co., Ltd. Process for preparing resin metal salts. 4,566,997, Cl. 260-105.000.

Satoh, Kohichi: *See*—
Murao, Yoshikazu; Sawayama, Shigeru; and Satoh, Kohichi, 4,567,300, Cl. 564-215.000.

Sawa, Natsuo; Masuda, Takeshi; and Mizui, Takashi, to Shikoku Chemicals Corp. Isocyanuric acid adduct of 2-vinyl-4,6-diamino-S-triazine. 4,567,259, Cl. 544-207.000.

Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, to Canon Kabushiki Kaisha; and Tohoku Steel Co., Ltd. Magnetic recording medium. 4,567,116, Cl. 428-694.000.

Sawai, Mitsumasa: *See*—
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.

Sawayama, Shigeru: *See*—
Murao, Yoshikazu; Sawayama, Shigeru; and Satoh, Kohichi, 4,567,300, Cl. 564-215.000.

Sawyer, Carleton E.; and Masterman, Hugh C., to Display Components, Inc. Core element for electrodynamic rotary machine. 4,566,179, Cl. 29-596.000.

SCAL Societe de Conditionnements en Aluminium: *See*—
Catrain, Yves; Guerrier, Claude; and Revol, Jacques, 4,567,092, Cl. 428-246.000.

Scandpower, Inc.: *See*—
Smith, Robert, 4,567,013, Cl. 376-247.000.

Schachenmann, Andreas, to Sulzer Brothers Limited. Air discharge device for a weaving machine. 4,566,497, Cl. 139-1.00C.

Schaefer, William L., to PPG Industries, Inc. Bushing construction. 4,566,888, Cl. 65-1.000.

Schafer, Eberhard: *See*—
Mueller, Siegfried; and Schafer, Eberhard, 4,566,472, Cl. 132-112.000.

Schanze, Klaus: *See*—
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.

Scharf, Emil: *See*—
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.

Scharnowski, Gerhard: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,566,196, Cl. 33-125.00R.

Schaus, John M., to Eli Lilly and Company. Method of preparing octahydro-1H(and 2H)-pyrazolo[3,4-g]quinolines. 4,567,266, Cl. 546-82.000.

Schedele, Helmut; and Kimpel, Rolf-Dieter, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,567,457, Cl. 335-128.000.

Scheef, Emil: *See*—
Schulze, Werner; Gerich, Josef; Scheef, Emil; and Dautel, Heinz, 4,566,723, Cl. 285-86.000.

Scheib, Klaus: *See*—
Eicken, Karl; Scheib, Klaus; Theobald, Hans; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,567,263, Cl. 544-263.000.

Scher, Herbert I.: *See*—
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., 4,567,087, Cl. 428-211.000.

Scherer, George; Joswick, Walter; and Blonder, Isaac S., to Blonder-Tongue Laboratories, Inc. Special program decoding of scrambled subscription television transmissions. 4,567,516, Cl. 358-114.000.

Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Laurent, Henry; Annen, Klaus; and Wiechert, Rudolf, 4,567,002, Cl. 260-397.400.
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,567,195, Cl. 514-419.000.

Schering-Prebbles Limited: *See*—
Anscomb, Timothy, 4,566,613, Cl. 222-541.000.

Schiek, Burkhard: *See*—
Schilz, Wolfram; and Schiek, Burkhard, 4,567,484, Cl. 343-14.000.

Schiffers, Ulrich: *See*—
Muller, Rainer; and Schiffers, Ulrich, 4,566,267, Cl. 60-39.070.

Schilger, Herbert K. Composite floor system. 4,566,240, Cl. 52-414.000.

Schillinger, Ekkehard: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,567,195, Cl. 514-419.000.

Schilz, Wolfram; and Schiek, Burkhard, to U.S. Philips Corporation. Doppler radar measuring apparatus. 4,567,484, Cl. 343-14.000.

Schirmer, Ulrich: *See*—
Plath, Peter; Schirmer, Ulrich; Reissenweber, Gernot; Wuerzer, Bruno; and Retzlaff, Guenter, 4,566,900, Cl. 71-100.000.

Schlagel, Lester. Grain drying and storage structure. 4,566,205, Cl. 34-232.000.

Schlagheck, Werner: *See*—
Wilhelm, Dieter; Schlagheck, Werner; and Toussaint, Rene , 4,567,397, Cl. 313-318.000.

Schlanger, Samuel L. Vehicle control safety system. 4,566,555, Cl. 180-274.000.

Schlapkohl, Joachim: *See*—
Friederichs, Karl-Heinz; and Schlapkohl, Joachim, 4,567,415, Cl. 318-565.000.

Schlegel GmbH: *See*—
Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, 4,566,680, Cl. 269-74.000.

Schlegel, Rolf: *See*—
Richter, Ekkehard; Knoblauch, Karl; Schlegel, Rolf; and Korbacher, Werner, 4,566,881, Cl. 55-25.000.

Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, to Schlegel GmbH. Vertically adjustable device. 4,566,680, Cl. 269-74.000.

Schleich, Heinrich; and Yegenoglu, Kemal, to Ernst Winter & Sohn (GmbH & Co). Method and device for sharpening a grinding disk. 4,566,426, Cl. 125-11.00R.

Schlingmann, Merten: *See*—
Voelskow, Hartmut; and Schlingmann, Merten, 4,567,140, Cl. 435-42.000.

Schlumberger Technology Corporation: *See*—
Bagley, James T.; and Simon, Maurice L., 4,566,544, Cl. 175-4.560.
Shakra, Farid J., 4,566,317, Cl. 73-155.000.

Schmadel, Donald C., Jr., to Chevron Research Company. Process of fabricating a portion of an optical fiber capable of reflecting predetermined wavelength bands of light. 4,566,889, Cl. 65-3.200.

Schmidle & Fitz, Film-Gerate-Verleih: *See*—
Haberl, Karl; and Resch, Klaus, 4,566,391, Cl. 105-215.00R.

Schmidt, Gunther: *See*—
Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,567,178, Cl. 514-215.000.

Schmidt, Patrick J.: *See*—
Schmidt, Richard J.; Schmidt, Ronald R.; Schmidt, Walter E.; and Schmidt, Patrick J., 4,566,287, Cl. 62-188.000.

Schmidt, Richard J.; Schmidt, Ronald R.; Schmidt, Walter E.; and Schmidt, Patrick J. Post mix dispensing machine. 4,566,287, Cl. 62-188.000.

Schmidt, Ronald R.: *See*—
Schmidt, Richard J.; Schmidt, Ronald R.; Schmidt, Walter E.; and Schmidt, Patrick J., 4,566,287, Cl. 62-188.000.

Schmidt, Walter E.: *See*—
Schmidt, Richard J.; Schmidt, Ronald R.; Schmidt, Walter E.; and Schmidt, Patrick J., 4,566,287, Cl. 62-188.000.

Schmidt, Werner J., to Lever Brothers Company. Edible fat and a process for producing such fat. 4,567,056, Cl. 426-607.000.

Schmidt, Wolfram: *See*—
Ernst, Hansgeorg; Schmidt, Wolfram; and Paust, Joachim, 4,567,261, Cl. 544-251.000.

Schmied, Samuel, to S. Schmied & Co., elektrotechnische Bedarfsartikel en gros, ASM-Tableaubau. Construction set for the erection of mounting structures. 4,566,742, Cl. 312-257.0SK.

Schmitt, Michel: *See*—
Chauveau, Jean-Marc; and Schmitt, Michel, 4,566,563, Cl. 188-18.00A.

Schmucker, Wolfgang, to FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien. Method and apparatus for monitoring the operation of a friction false-twisting unit. 4,566,262, Cl. 57-264.000.

Schnabel, Jurgen; and Plath, Jurgen, to Didier-Werke AG. Method of mounting a metal band about a cover plate. 4,566,925, Cl. 156-86.000.

Schneeberger, Peter. Candle-shaped luminary. 4,567,548, Cl. 362-161.000.

Schneider, Egon, to Krones AG Hermann Kronseder, Maschinenfabrik. Vessel separating apparatus for use in particular in vessel handling machines. 4,566,583, Cl. 198-459.000.

Schneider, Ronald A., to Chevron Research Company. Process for the oxidation of gaseous hydrocarbons. 4,566,988, Cl. 252-373.000.

Schneiderman, Charles I. Dispenser gloves and stockinetts and methods of manufacturing same. 4,567,065, Cl. 427-230.000.

Schneller, Joseph W., to National Gypsum Company. Progressive demountable partition. 4,566,241, Cl. 52-481.000.

Schnetzinger, Richard W.: *See*—
Stadnick, Richard P.; and Schnetzinger, Richard W., 4,567,039, Cl. 132-70.000.

Schoenleben, Willibald: *See*—
Boettger, Guenter; Hammer, Hans; Hertel, Otto; Jeschek, Gerhard; Mueller, Herbert; Scharf, Emil; and Schoenleben, Willibald, 4,567,303, Cl. 564-475.000.

Schofield, John, to U.S. Philips Corporation. Acoustic surface wave device. 4,567,453, Cl. 333-194.000.
Schon, Georg: *See*—
Ott, Gunther; Dobbelstein, Arnold; Geist, Michael; Schon, Georg; and Ahlers, Klaas, 4,566,963, Cl. 204-181.700.
Schook, Michael N. Dumbell and barbell exercise equipment. 4,566,690, Cl. 272-123.000.
School of Medicine Texas Tech. Univ. Health Servcs. Ctr.: *See*—
Janssen, Herbert F., 4,566,462, Cl. 128-677.000.
Schott Glaswerke: *See*—
Ertel, Gerhard, 4,566,892, Cl. 65-59.240.
Gliemeroth, Georg; Speit, Burkhard; and Krolla, Hans-Georg, 4,566,987, Cl. 252-301.40F.
Schreiner, Peter G., III: *See*—
Gray, James S.; Chamberlin, James W.; McBride, Alan L.; and Schreiner, Peter G., III, 4,567,591, Cl. 370-109.000.
Schroeder, Eugene, to Indianapolis Center for Advanced Research. Ultrasonic driver and receiver. 4,566,331, Cl. 73-632.000.
Schroeppel, Edward A.: *See*—
Koning, Gerrit; and Schroeppel, Edward A., 4,566,456, Cl. 128-419.0PG.
Schuler, Ralf; and Maahs, Gunther, to Chemische Werke Huls Aktiengesellschaft. Production of copper(II) hydroxide phosphate with a light natural color and an average grain size less than 10 microns. 4,567,220, Cl. 524-413.000.
Schulmerich Carillons, Inc.: *See*—
Keenan, Charles E.; Mattern, Richard E.; and Vaccaro, Charles A., 4,566,400, Cl. 116-171.000.
Schultz, Neal G.: *See*—
Jenkins, Jerome D.; and Schultz, Neal G., 4,566,938, Cl. 156-643.000.
Schultz, Paul B.; and Yarkosky, Eugene F., to Enthone, Incorporated. Electroless nickel plating of aluminum. 4,567,066, Cl. 427-305.000.
Schulz, John A.: *See*—
Chorvat, Robert J.; Prodan, Kathleen A.; and Schulz, John A., 4,567,270, Cl. 546-183.000.
Schulze, Werner; Gerich, Josef; Scheef, Emil; and Dautel, Heinz, to Alfred Karcher GmbH & Co. Coupler for hose lines of high-pressure cleaning and spraying equipment. 4,566,723, Cl. 285-86.000.
Schumacher, Peter M., to Measuronics Corporation. Multiple image generation and analysis system. 4,567,515, Cl. 358-107.000.
Schunemann, Klaus: *See*—
Szabo, Laszlo; and Schunemann, Klaus, 4,567,450, Cl. 331-107.0DP.
Schuoecker, Dieter; and Klement, Ekkehard, to Siemens Aktiengesellschaft. Method and optical apparatus for converting residue numbers into positionally notated numbers. 4,567,355, Cl. 235-310.000.
Schwab, Klaus, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Liquid-crystal display for microscopes. 4,567,478, Cl. 340-705.000.
Schwartz, Lawrence M.: *See*—
Groen, Robertus W. C.; de Jonge, Cornelis A. M.; Schwartz, Lawrence M.; and van Lier, Johannes C., 4,567,534, Cl. 358-342.000.
Schwartz, Samuel, to University of Minnesota, Regents of the. Method for quantitatively determining the amount of hemoglobin in a biological sample. 4,567,148, Cl. 436-66.000.
Schwartz, Victor M.; and Miller, Robert G., to Timberline Geodesics, Inc. Ledger hanger for geodesic domes. 4,566,818, Cl. 403-172.000.
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., to Schering, Aktiengesellschaft. Azaprostacyclins, their preparation and pharmaceutical use. 4,567,195, Cl. 514-419.000.
Schwerdtel, Ernst; and Lang, Hans-Jorg. Apparatus for the dosed filling of highly viscous material. 4,566,249, Cl. 53-55.000.
Schwierz, Peter P.; Rebhan, Adolf; and Moraw, Roland, to Hoechst Aktiengesellschaft. Fixing device. 4,566,783, Cl. 355-14.0FU.
Scientific-Atlanta, Inc.: *See*—
Mobley, Joseph G., 4,567,517, Cl. 358-120.000.
Sclavo, S.p.A.: *See*—
Tabacco, Alessandro; Tarli, Paolo; and Neri, Paolo, 4,567,150, Cl. 436-87.000.
SCM Corporation. Cheese-containing confectionary-like coating. 4,567,047, Cl. 426-94.000.
Scott, Evan, Jr.: *See*—
Woods, Karl E., I; and Scott, Evan, Jr., 4,567,337, Cl. 200-331.000.
Scott Paper Company: *See*—
Streeper, Leonard W.; and Chille, Joseph R., 4,566,154, Cl. 19-296.000.
Seal, David B.: *See*—
Li, Hsin L.; Morris, Thomas K.; Seal, David B.; and Limoncelli, Edward V., 4,566,525, Cl. 164-463.000.
Secemski, Isaac I.; and Podgorsky, Joseph J., to O'Donnell & Associates, Inc. Liquid detergents containing cellulose ethers stabilized by glycerol. 4,566,993, Cl. 252-559.000.
Secom Co., Ltd.: *See*—
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, 4,567,472, Cl. 340-525.000.
Segerstrom, Kjell E. L.: *See*—
Norberg, Gustav S. I.; Segerstrom, Kjell E. L.; and Ahl, Tommy E., 4,566,951, Cl. 204-12.000.
Seidel, Jurgen: *See*—
Durr, Manfred; Gajdos, Benedikt; Gneuss, Klaus-Dieter; Harhausen, Ekkehard; and Seidel, Jurgen, 4,567,202, Cl. 514-656.000.
Seidentop, Alfred T.; and Johnson, John E., to Stretch Forming Corporation. Gravity traction apparatus. 4,566,693, Cl. 272-144.000.
Seikosha Co., Ltd.: *See*—
Matsumoto, Hiroshi, 4,566,815, Cl. 400-641.000.
Seipenbusch, Jurgen; and Dohren, Hans, to Ruhrkohle AG. Reactor for coal gasification. 4,566,880, Cl. 48-73.000.
Seita, Toru: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.
Seitz, Alan F.; and Seitz, Karl G., to Data Motion, Inc. Paper feed tractor with compensating pulley assembly utilizing cantable insert. 4,566,618, Cl. 226-74.000.
Seitz Enzinger Noll Maschinenbau Aktiengesellschaft: *See*—
Borg, Siegbert, 4,566,912, Cl. 134-13.000.
Seitz Filter Werke Theo & Geo Seitz GmbH & Co.: *See*—
Badenhop, Charles T.; and Fischer, Joachim, 4,567,009, Cl. 264-41.000.
Seitz, Karl G.: *See*—
Seitz, Alan F.; and Seitz, Karl G., 4,566,618, Cl. 226-74.000.
Seitz, Steven P.: *See*—
Nicolaou, Kyriacos C.; Petasis, Nicos A.; and Seitz, Steven P., 4,567,290, Cl. 560-124.000.
Sekella, T. Curran, to Facet Enterprises, Inc. Self-adjusting electromagnetic cone brake. 4,566,575, Cl. 192-84.00C.
Seki, Masanori: *See*—
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, 4,566,194, Cl. 33-18.100.
Sekine, Kazumi, to Canon Kabushiki Kaisha. Electronic instrument. 4,567,354, Cl. 235-145.00R.
Selig, Manfred: *See*—
Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Staudinger, Gunther, 4,567,297, Cl. 564-208.000.
Selin, Johan-Fredrik: *See*—
Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, 4,567,255, Cl. 536-30.000.
Sell, William J.; Riege, David H.; and Marinkovich, Vincent A., to Mast Immunosystems, Ltd. Binding assay system and method of making and using same. 4,567,149, Cl. 436-513.000.
Semp, Bernard A.; and Teng, Daniel M., to Philip Morris Incorporated. Process for dissimilatory denitrification of tobacco materials. 4,566,469, Cl. 131-308.000.
Sencorp: *See*—
Becht, Carl T., 4,566,621, Cl. 227-109.000.
Sentralinstitutt for Industriell Forskning: *See*—
Blindheim, Ulf; Haegh, Gerd S.; and Nilsen, Bjorn P., 4,567,313, Cl. 585-480.000.
Sesser, George L., to Nelson Irrigation Corporation. Step-by-step rotary sprinkler head with improved stream diffusing assembly. 4,566,632, Cl. 239-230.000.
Sethi, Amar J.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,566,909, Cl. 127-33.000.
Sevrin, Mireille: *See*—
Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, 4,567,177, Cl. 514-214.000.
Seyfried, Philippe: *See*—
Dubost, Rene ; Fiori, Robert; and Seyfried, Philippe, 4,566,361, Cl. 83-454.000.
Shafer, Sheldon J.: *See*—
Fox, Daniel W.; and Shafer, Sheldon J., 4,567,249, Cl. 528-347.000.
Shaffner, Richard L. Toe protector. 4,566,208, Cl. 36-110.000.
Shah, Atul: *See*—
Jorne, Jacob; Rosyaie, Emad; and Shah, Atul, 4,567,120, Cl. 429-72.000.
Shakra, Farid J., to Schlumberger Technology Corporation. Borehole flow meter. 4,566,317, Cl. 73-155.000.
Shannon, David M.: *See*—
Lam, Chiu T.; and Shannon, David M., 4,567,157, Cl. 502-208.000.
Shanton, Kenneth J., to Wiggins Teape Group Limited, The. Record material. 4,567,498, Cl. 346-216.000.
Sharp Kabushiki Kaisha: *See*—
Aiba, Masahiko, 4,567,353, Cl. 219-501.000.
Hashimoto, Shintaro; and Tanimoto, Akira, 4,567,573, Cl. 364-900.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,567,060, Cl. 427-87.000.
Morihisa, Mitsuo; and Akao, Hideyuki, 4,567,575, Cl. 364-900.000.
Tanaka, Shinichi, 4,567,468, Cl. 340-347.0DA.
Shaw, Dave H.: *See*—
Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., 4,567,205, Cl. 518-715.000.
Shebuski, Robert C., to Outboard Marine Corporation. Method and apparatus for removing a casting from a sandbox. 4,566,520, Cl. 164-131.000.
Shell Oil Company: *See*—
Balas, Jaroslav C., 4,567,251, Cl. 528-487.000.
Haak, Frederik W., 4,566,885, Cl. 62-9.000.
O'Meara, Joseph D., Jr.; Yuan, Herbert H.; Lease, William O.; and Stapleton, Robert G., 4,567,373, Cl. 250-573.000.
Paardekooper, Stephanus; and Pek, Johan J. B., 4,566,883, Cl. 55-329.000.
Payne, George B.; Soloway, Samuel B.; Powell, James E.; Roman, Steven A.; and Kollmeyer, Willy D., 4,567,283, Cl. 549-546.000.
Singhal, Surendra N., 4,566,335, Cl. 73-849.000.
Shelton, David P.: *See*—
Buckingham, Amyand D.; and Shelton, David P., 4,567,596, Cl. 372-22.000.

Shen, John C. S.: *See*—
Piltingsrud, Douglas H.; and Shen, John C. S., 4,567,096, Cl. 428-315.500.
Shibata, Makoto: *See*—
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,567,493, Cl. 346-140.00R.
Shibayama, Teruji: *See*—
Hara, Kunio; Tanaka, Toshie; Shibayama, Teruji; Morisaki, Minoru; and Kaneko, Yoshio, 4,566,924, Cl. 156-73.500.
Shida, Masami: *See*—
Sakamoto, Masahide; and Shida, Masami, 4,566,420, Cl. 123-489.000.
Shiembob, Lawrence T., to United Technologies Corporation. Abrasive/abradable gas path seal system. 4,566,700, Cl. 277-53.000.
Shiga, Masao: *See*—
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, 4,566,810, Cl. 384-280.000.
Shigeta, Masatomo: *See*—
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,567,086, Cl. 428-166.000.
Shikoku Chemicals Corp.: *See*—
Sawa, Natsuo; Masuda, Takeshi; and Mizui, Takashi, 4,567,259, Cl. 544-207.000.
Shima, Masanori: *See*—
Hirai, Yoshihisa; Shima, Masanori; and Aoki, Hirohiko, 4,566,825, Cl. 405-267.000.
Shimada, Kenjiro; Otomo, Masao; Tomita, Fusao; and Ito, Shingo, to Kyowa Hakko Kogyo Co., Ltd. Pharmaceutical composition for treating protozoan disease containing at least one tetrocarcin. 4,567,164, Cl. 514-33.000.
Shimada, Yasuhisa: *See*—
Oshima, Goro; Ono, Satoru; and Shimada, Yasuhisa, 4,567,485, Cl. 343-358.000.
Shimada, Yuzo; Utsumi, Kazuaki; Ikeda, Teruyuki; and Suzuki, Masanori, to NEC Corporation. Multilayer ceramic substrate with interlayered capacitor. 4,567,542, Cl. 361-321.000.
Shimadzu Corporation: *See*—
Suzuki, Jugoro, 4,566,792, Cl. 356-319.000.
Shimase, Akira: *See*—
Ishitani, Tohru; Tamura, Hifumi; and Shimase, Akira, 4,567,398, Cl. 313-362.100.
Miyauchi, Tateoki; Hongo, Mikio; Mizukoshi, Katsuro; Yamaguchi, Hiroshi; and Shimase, Akira, 4,566,765, Cl. 350-619.000.
Shimauchi, Yoshiki: *See*—
Yasuda, Yasushi; Enomoto, Hiromu; Shimauchi, Yoshiki; and Tahara, Akinori, 4,567,380, Cl. 307-290.000.
Shimazaki, Takashi, to Kabushiki Kaisha Toshiba. Developing apparatus. 4,566,402, Cl. 118-653.000.
Shimizu, Yuichi: *See*—
Ito, Giichi; Nakano, Ichizo; Shimizu, Yuichi; Mukai, Kosaku; and Suzuki, Saiju, 4,567,347, Cl. 219-124.340.
Shimura, Yoshihiko: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Shimura, Yoshihiko; Ishiguro, Ken; and Nagai, Koichi, 4,567,114, Cl. 428-480.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takamizawa, Minoru; Yamamoto, Akira; and Nagura, Shigehiro, 4,567,245, Cl. 526-279.000.
Tawara, Yoshio; Ohashi, Ken; and Kikuchi, Hideaki, 4,567,576, Cl. 365-2.000.
Shin Nisso Kako Co., Ltd.: *See*—
Tanino, Hiroshi; Okamoto, Tetsuhiko; and Ueyama, Shinichiro, 4,567,028, Cl. 423-300.000.
Shinada, Koichi: *See*—
Nagano, Kyoichi; Naganuma, Hiroshi; Shinada, Koichi; Tamura, Motonori; and Soneda, Shigenobu, 4,566,916, Cl. 148-26.000.
Shinmi, Akira: *See*—
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.
Shinoda, Morimasa; and Takahashi, Takamasa, to Nippon Univac Supply Kaisha, Ltd.; and Limited Company of Shinoda Sekkei Jimusho. Monitoring apparatus for color printing. 4,567,506, Cl. 358-11.000.
Shinohara, Akio, to Showa Denko Kabushiki Kaisha. Method and apparatus for measuring methane concentration in gas. 4,567,366, Cl. 250-339.000.
Shinzawa, Akira: *See*—
Hasegawa, Hiroshi; Shinzawa, Akira; and Kohno, Yoshiki, 4,566,994, Cl. 252-574.000.
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, to Murata Kikai Kabushiki Kaisha. Automatic work exchanging apparatus. 4,566,837, Cl. 414-222.000.
Shiozawa, Kazuo; and Suzuki, Kijiro, to Konishiroku Photo Industry Co., Ltd. Automatic exposure camera. 4,566,774, Cl. 354-413.000.
Shirai, Kiyoshi: *See*—
Nitou, Hiroyasu; Shirai, Kiyoshi; and Takahashi, Osamu, 4,566,425, Cl. 123-600.000.
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, to Secom Co., Ltd. Security-ensuring apparatus having an operational guidance function. 4,567,472, Cl. 340-525.000.
Shiraishi, Hideo: *See*—
Tadokoro, Tomoo; Shiraishi, Hideo; and Okimoto, Haruo, 4,566,412, Cl. 123-216.000.
Shirao, Shojiro: *See*—
Baba, Kiyokazu; Shirao, Shojiro; Nishida, Kenji; and Kiyosawa, Hiroshi, 4,566,834, Cl. 414-27.000.
Shiroi, Takashi: *See*—
Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, 4,566,996, Cl. 260-239.00A.
Shopsmith, Inc.: *See*—
Bartlett, Robert L.; Haas, Charles J.; and Legler, John G., 4,566,510, Cl. 144-1.00C.
Shoshi, Masayuki: *See*—
Ohta, Masafumi; Sasaki, Masaomi; and Shoshi, Masayuki, 4,567,124, Cl. 430-59.000.
Showa Denko Kabushiki Kaisha: *See*—
Nagato, Nobuyuki; Maki, Kenichiro; Uematsu, Tomoe; and Ishioka, Ryoji, 4,567,292, Cl. 560-245.000.
Shinohara, Akio, 4,567,366, Cl. 250-339.000.
Shu, David F., to TDS, Inc. RF Shielded electronic component housing. 4,567,318, Cl. 174-35.0GC.
Shum, Ming S.: *See*—
Janikowski, Daniel S.; and Shum, Ming S., 4,567,111, Cl. 428-457.000.
Sibbald, Alastair: *See*—
Covington, Arthur K.; and Sibbald, Alastair, 4,567,006, Cl. 264-22.000.
Sibilia, John P.; Kim, Hyo-gun; and Paterson, Arthur R., to Allied Corporation. Process for preparing conducting polymeric compositions. 4,566,991, Cl. 252-512.000.
Sieber, Albrecht, to Robert Bosch GmbH. Control system for an internal combustion engine. 4,566,414, Cl. 123-357.000.
Sieder, Burton C.: *See*—
Binning, Ronald L.; and Sieder, Burton C., 4,566,838, Cl. 414-278.000.
Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,567,183, Cl. 514-264.000.
Siegel, Paul H.; and Todd, Stephen J., to International Business Machines Corporation. Fixed rate constrained channel code generating and recovery method and means having spectral nulls for pilot signal insertion. 4,567,464, Cl. 340-347.0DD.
Siemens Aktiengesellschaft: *See*—
Egerbacher, Werner; and Wunderlich, Dieter, 4,567,504, Cl. 357-79.000.
Haussmann, Wolfgang, 4,567,442, Cl. 329-145.000.
Heynisch, Hinrich, 4,567,406, Cl. 315-5.330.
Hildebrand, Reinhard; and Waldmann, Bernd, 4,566,399, Cl. 116-28.00R.
Hollaus, Reinhard; Zehetbauer, Rudolf; and Bednorz, Klaus, 4,567,316, Cl. 136-246.000.
Lemche, Josef, 4,567,336, Cl. 200-305.000.
Peche, Gerhard, 4,567,338, Cl. 200-144.00B.
Schedele, Helmut; and Kimpel, Rolf-Dieter, 4,567,457, Cl. 335-128.000.
Schuoecker, Dieter; and Klement, Ekkehard, 4,567,355, Cl. 235-310.000.
Skafvenstedt, Bengt; and Ahlgren, Sture, 4,567,492, Cl. 346-136.000.
Siemens Corporate Research & Support, Inc.: *See*—
Sinberg, Howard, 4,567,539, Cl. 361-92.000.
Sigel, Albert: *See*—
Maier, Peter; Attinger, Karl; Sigel, Albert; Hansel, Gernot; Kutscher, Erwin; and Walter, Hartmut, 4,566,830, Cl. 409-182.000.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and deWitt, Paolo, 4,567,200, Cl. 514-547.000.
Signetics Corporation: *See*—
van de Ven, Everhardus P. G. T.; and Towner, Janet M., 4,566,177, Cl. 29-590.000.
Signoretto, Roberto, to Photo Engineering International s.r.l. Process to establish and check the matching of negatives and processing envelopes in photographic laboratories. 4,567,356, Cl. 235-375.000.
Sijbers, Peter J. M.: *See*—
van de Plassche, Rudy J.; and Sijbers, Peter J. M., 4,567,426, Cl. 323-315.000.
Silverman, Daniel, to Walters, William R. Liquid level control apparatus. 4,566,484, Cl. 137-403.000.
Simak, Petr: *See*—
Naarmann, Herbert; Heckmann, Walter; Kohler, Gernot; and Simak, Petr, 4,567,250, Cl. 528-423.000.
Simmons U.S.A. Corporation: *See*—
Stumpf, Walter, 4,566,926, Cl. 156-165.000.
Simon, Gilbert I.; and Witkin, Roy T. Chemotherapeutic method for treating periodontal disease, and composition therefore. 4,567,036, Cl. 424-51.000.
Simon, Maurice L.: *See*—
Bagley, James T.; and Simon, Maurice L., 4,566,544, Cl. 175-4.560.
Simon, Richard K.: *See*—
Wells, Gregory J.; and Simon, Richard K., 4,567,368, Cl. 250-379.000.
Simon, Terry L., to Breneman Company, The. Window shade roller with manual severing means. 4,566,517, Cl. 160-263.000.
Simonovitch, Chaim; Hoffman, Theodor; and Sasson, Sabar, to ABIC Ltd. Process for the preparation of benzothiazepine derivatives. 4,566,995, Cl. 260-239.30B.
Sims, Cecil, to Sundstrand Corporation. Voltage regulator with maximum current limit. 4,567,422, Cl. 322-25.000.
Sinberg, Howard, to Siemens Corporate Research & Support, Inc. Power interruption and brownout detector. 4,567,539, Cl. 361-92.000.

Singer Company, The: *See*—
Jones, John E.; and Glenn, W. K., III, 4,566,884, Cl. 55-357.000.
Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,567,186, Cl. 514-300.000.
Singhal, Surendra N., to Shell Oil Company. Method and apparatus for testing fiber reinforced plastic laminates. 4,566,335, Cl. 73-849.000.
Sintokogio Ltd.: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,566,521, Cl. 164-160.100.
Sisson, Jeffrey L.: *See*—
Britt, James E.; Laskowski, Kenneth W.; Sisson, Jeffrey L.; and Rinehart, Stephen A., 4,566,782, Cl. 355-14.0SH.
Sitzes, Fred B., to Interco Incorporated. Shoe construction. 4,566,197, Cl. 36-011.000.
Sivaramakrishnan, Kallidaikurichi N. Polymeric quaternary ammonium salts possessing antimicrobial activity and methods for preparation and use thereof. 4,567,302, Cl. 564-286.000.
Skafvenstedt, Bengt; and Ahlgren, Sture, to Siemens Aktiengesellschaft. Paper transport device for a recorder. 4,567,492, Cl. 346-136.000.
SKF Industrial Trading & Development Company B.V.: *See*—
v Engelenburg, Hendrik; and Heemskerk, Rugerus S., 4,566,744, Cl. 339-8.00L.
SKF Nova AB: *See*—
Lundgren, Bengt, 4,566,811, Cl. 384-484.000.
Skibbe, Rodney D.: *See*—
Lillie, James D.; and Skibbe, Rodney D., 4,566,229, Cl. 51-241.0VS.
Skipor, Eugen, to Rockwell International Corporation. Gear housing device for preventing oil leakage. 4,566,351, Cl. 74-606.00R.
Skogman, Bengt G.; Svensson, Hans T.; and Torres, Eduardo E., to Karlstad Vulk; and Montage Aktiebolag. Sandwich material. 4,567,088, Cl. 428-213.000.
Skuballa, Werner: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,567,195, Cl. 514-419.000.
Sleger, Leon F.; and DiNozzi, Robert D., to USM Corporation. Component verifier. 4,566,594, Cl. 209-539.000.
Slezak, Ray J. Wind rotor. 4,566,854, Cl. 416-119.000.
Smart, Michael G., to G. A. Platon Limited. Opto-electronic position sensing. 4,566,337, Cl. 73-861.560.
Smayling, Michael C.; and Duane, Michael P., to Texas Instruments Incorporated. Method of making insulated gate field effect transistor with a lightly doped drain using oxide sidewall spacer and double implantations. 4,566,175, Cl. 29-576.00B.
Smigel, Robert L.; and Paliwoda, Kenneth J. Insulation system. 4,566,239, Cl. 52-407.000.
Smith, Allen R.: *See*—
Vensko, George; Carlin, Lawrence; Potter, John; and Smith, Allen R., 4,567,606, Cl. 381-43.000.
Smith, David L. Bag dispenser. 4,566,607, Cl. 221-155.000.
Smith, David W.: *See*—
Ripple, Dale B.; and Smith, David W., 4,566,466, Cl. 128-781.000.
Smith, Douglas: *See*—
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Alcock, Philip, 4,566,503, Cl. 140-140.000.
Smith, Fred T., to Heil Co., The. Mechanism for dumping a container into a refuse collection vehicle. 4,566,840, Cl. 414-408.000.
Smith, Hubert E.; Wall, William A.; and Burns, Morrison R., Jr., to United States of America, National Aeronautics and Space Administration. Automated weld torch guidance control system. 4,567,348, Cl. 219-124.340.
Smith, James A., to Creative Products Resource Associates, Ltd. Carpet treating composition. 4,566,980, Cl. 252-8.600.
Smith, Jan E. Elevated infant positioner. 4,566,449, Cl. 128-133.000.
Smith, Kenneth C. A.; and Erasmus, Stephen J., to National Research Development Corporation. Correction of astigmatism in electron beam instruments. 4,567,369, Cl. 250-397.000.
Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H., 4,567,176, Cl. 514-212.000.
Smith, Louis W.; and Csapo, Janos I., to GTE Business Communication Systems, Inc. Secretarial telephone station for use with a secretarial answering system. 4,567,324, Cl. 179-27.0FH.
Smith, Peter E.; and Laxton, Raymond, to AGB Research PLC. Transmitting and storing data relating to television viewing. 4,567,511, Cl. 358-84.000.
Smith, Robert, to Scandpower, Inc. Hydrogen measuring device. 4,567,013, Cl. 376-247.000.
Smith, Robert A.: *See*—
McDonnell, Damien G.; and Smith, Robert A., 4,566,759, Cl. 350-346.000.
Smous, Dale: *See*—
Anscher, Joseph; and Smous, Dale, 4,566,660, Cl. 248-74.200.
Smuda, Siegfried; Horner, Peter; Kogel, Karl; and Zeitler, Peter, to FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien. Hydraulic device for rerailing vehicles. 4,566,673, Cl. 254-84.000.
Snape, Edwin: *See*—
Sandrock, Gary D.; and Snape, Edwin, 4,566,281, Cl. 62-48.000.
Sneden, Marcia A. Character identity game. 4,566,698, Cl. 273-249.000.
Snyder, Daniel D.: *See*—
Sachleben, Leroy R.; Korte, Kevin R.; Snyder, Daniel D.; and Allen, Terry L., 4,566,468, Cl. 131-297.000.
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., to Ford Aerospace & Communications Corporation. Method for mass producing solar radiation reflectors. 4,566,432, Cl. 126-438.000.
Societe Alsacienne d'Aluminium: *See*—
Bernhard, Marcel, 4,567,112, Cl. 428-461.000.
Societe Alsacienne de Construction de Material Textile: *See*—
Vuillet, Jean-Pierre, 4,566,566, Cl. 192-24.000.
Societe Anonyme de Telecommunications: *See*—
Bailly, Francois P.; Bourgoin, Alain; and Israel, Renato, 4,567,329, Cl. 179-18.0FA.
Societe Anonyme des Ets. Pierre Roch: *See*—
Gruhler, Siegfried; and Wolf, Michael, 4,566,199, Cl. 33-143.00M.
Societe Industrielle de Bellevaux, SIBEL: *See*—
Monie, Jean, 4,567,339, Cl. 200-153.0LB.
Thomas, Francis, 4,566,347, Cl. 74-125.000.
Societe Lyonnaise des Eaux et de l'Enclairage: *See*—
Cognet, Louis; Argoud, Christian; Matray, Francois; and Mallevialle, Joel, 4,567,020, Cl. 422-101.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Bizot, Henri; Dautremont, Jean; and Sylvian, Alain, 4,566,225, Cl. 51-165.720.
Societe Nationale Industrielle et Aerospatiale: *See*—
Beau, Jean F.; and Gauthier, Michel, 4,566,740, Cl. 308-10.000.
Sodler, Walter; Knothe, Erich; Maaz, Gunther; and Madge, Joachim, to Sartorius GmbH. Analytical balance. 4,566,548, Cl. 177-229.000.
Sofranko, John A.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,567,307, Cl. 585-330.000.
Sogabe, Yoji; Uchida, Katsumi; and Harada, Kunihiko, to Achilles Corporation. Rubber coated fabric. 4,567,093, Cl. 428-250.000.
Sokalski, Robert G.: *See*—
Kenny, Andrew A.; Sokalski, Robert G.; Egle, Lawrence E.; and Stahly, Daniel C., 4,566,423, Cl. 123-571.000.
Solindo Equipment Leasing Ltd.: *See*—
Instone, Giles A.; and Instone, Jeremy A., 4,566,404, Cl. 119-8.000.
Soloway, Samuel B.: *See*—
Payne, George B.; Soloway, Samuel B.; Powell, James E.; Roman, Steven A.; and Kollmeyer, Willy D., 4,567,283, Cl. 549-546.000.
Somfy: *See*—
Brunier-Coulin, Charles, 4,567,416, Cl. 318-602.000.
Sommer, Hans-Jorg; Lamparter, Hansruedi; and Wermelinger, Maurizio, to Rieter Machine Works Ltd. Method and apparatus for monitoring chuck overspeed. 4,566,642, Cl. 242-18.00R.
Sommermann, Friedrich: *See*—
Lehner, August; Kopke, Helmut; Roller, Hermann; Balz, Werner; Grau, Werner; Koester, Eberhard; and Sommermann, Friedrich, 4,567,108, Cl. 428-425.900.
Soneda, Shigenobu: *See*—
Nagano, Kyoichi; Naganuma, Hiroshi; Shinada, Koichi; Tamura, Motonori; and Soneda, Shigenobu, 4,566,916, Cl. 148-26.000.
Sonneville International Corporation: *See*—
Sonneville, Roger P., 4,566,629, Cl. 238-117.000.
Sonneville, Roger P., to Sonneville International Corporation. Structure for fixing a rail to a tie. 4,566,629, Cl. 238-117.000.
Sony Corporation: *See*—
Okanobu, Taiwa, 4,567,444, Cl. 330-257.000.
Souda, Shigeru: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.
Soula, Gerard: *See*—
Lepage, Jean-Luc; and Soula, Gerard, 4,567,286, Cl. 556-469.000.
Sousek, Eugene A., to Piper Industries, Inc. Safety interlock mechanism for corn head assembly. 4,566,256, Cl. 56-10.200.
Southern Systems, Inc.: *See*—
Davidson, Marion A.; and Kiss, David B., 4,566,339, Cl. 73-862.390.
Southwire Company: *See*—
Chia, E. Henry; and Adams, Ronald D., 4,566,524, Cl. 164-461.000.
Sovonics Solar Systems: *See*—
Fournier, Eugene, 4,566,403, Cl. 118-718.000.
Space Age Manufacturing Co., Inc.: *See*—
Loyd, Lew W., Jr., 4,566,388, Cl. 102-361.000.
Specie, Roy L. General purpose dolly for campgrounds. 4,566,708, Cl. 280-47.13R.
Spector, Donald. Adhesive sports tape. 4,567,091, Cl. 428-222.000.
Spector, George: *See*—
Brady, Leon; and Spector, George, 4,566,200, Cl. 33-161.000.
Speit, Burkhard: *See*—
Gliemeroth, Georg; Speit, Burkhard; and Krolla, Hans-Georg, 4,566,987, Cl. 252-301.40F.
Spencer, Elbert M.: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,566,167, Cl. 29-437.000.
Sperry Corporation: *See*—
Decoene, Frans J. G. C.; and Vansteelant, Marc G., 4,566,379, Cl. 100-89.000.
Gershenson, Meir; Sweeny, Mark F.; Long, Dennis D.; and Fleming, David L., 4,567,438, Cl. 324-248.000.
Zbinden, Terry B., 4,567,428, Cl. 324-73.0PC.
Spicer, William E.: *See*—
Olego, Diego; Brock, David G.; Baumann, John A.; and Spicer, William E., 4,567,503, Cl. 357-54.000.
Spisak, Anthony F.; Stefanovic, Sava; and Pawloski, Curtis H., to Ex-Cell-O Corporation. Carton forming, sterilizing, filling and sealing machine. 4,566,251, Cl. 53-167.000.

Spivak, Igor V.: *See*—
Gorlov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., 4,566,587, Cl. 198-732.000.

Spolyar, John L. Portable roentgenographic cephalostat. 4,566,444, Cl. 128-303.00B.

Sprintschnik, Gerhard; Niderstatter, Walter; and Stroszynski, Joachim, to Hoechst Aktiengesellschaft. Two-stage process for the production of anodically oxidized aluminum planar materials and use of these materials in manufacturing offset-printing plates. 4,566,952, Cl. 204-27.000.

Srivastava, Gopal K.; and Lee, Ronald B., to Zenith Electronics Corporation. Auto tuning for an oscillator. 4,567,447, Cl. 331-1.00A.

Stadnick, Richard P.; and Schnetzinger, Richard W., to Revlon, Inc. Hair conditioning composition and method. 4,567,039, Cl. 132-70.000.

Stahly, Daniel C.: *See*—
Kenny, Andrew A.; Sokalski, Robert G.; Egle, Lawrence E.; and Stahly, Daniel C., 4,566,423, Cl. 123-571.000.

Stallworth, Herman: *See*—
Bhatia, Yog R.; and Stallworth, Herman, 4,567,213, Cl. 523-160.000.

Stanadyne, Inc.: *See*—
Berchtold, Max, 4,566,416, Cl. 123-458.000.

Standard Oil Company (Indiana): *See*—
Tovrog, Benjamin S.; Hoppin, Charles R.; and Johnson, Bryce V., 4,567,155, Cl. 502-123.000.

Standard Precision, Inc.: *See*—
Papp, John E.; and Nepomuceno, Bienvenido, 4,566,814, Cl. 400-354.100.

Stanley, Andrea: *See*—
Manning, Larry F.; and Stanley, Andrea, 4,566,590, Cl. 206-232.000.

Stapleton, Robert G.: *See*—
O'Meara, Joseph D., Jr.; Yuan, Herbert H.; Lease, William O.; and Stapleton, Robert G., 4,567,373, Cl. 250-573.000.

Staudinger, Gunther: *See*—
Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Staudinger, Gunther, 4,567,297, Cl. 564-208.000.

Stauffer Chemical Company: *See*—
Olego, Diego; Brock, David G.; Baumann, John A.; and Spicer, William E., 4,567,503, Cl. 357-54.000.

Stearns, Willis R.: *See*—
Irvine, Robert; Roetter, Frank T.; and Stearns, Willis R., 4,566,685, Cl. 271-150.000.

Stefanovic, Sava: *See*—
Spisak, Anthony F.; Stefanovic, Sava; and Pawloski, Curtis H., 4,566,251, Cl. 53-167.000.

Stein, Roland: *See*—
Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, 4,566,680, Cl. 269-74.000.

Stemple, Gunter. Defibrillator circuit and electrodes therefor. 4,566,457, Cl. 128-419.00D.

Stendel, Wilhelm: *See*—
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,567,168, Cl. 514-89.000.

Stephano, Marc, to Cibie Projecteurs. Automobile headlamp with inclined front glass. 4,567,550, Cl. 362-297.000.

Sterckx, Jozef V. M.: *See*—
Detourney, Jacquy J. C.; and Sterckx, Jozef V. M., 4,567,027, Cl. 423-101.000.

Stereo Concepts, Inc.: *See*—
Bruney, Paul F.; and Bugash, Robert S., 4,567,607, Cl. 381-1.000.

Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, 4,567,186, Cl. 514-300.000.

Stewart, David G.: *See*—
Nay, Barry; and Stewart, David G., 4,567,160, Cl. 502-326.000.

Stewart, Lowell J.: *See*—
Haselby, Robert D.; Haugh, Samuel R.; and Stewart, Lowell J., 4,567,565, Cl. 364-520.000.

Stewart, Robert S., to Carrier Corporation. Internal line break assembly. 4,567,390, Cl. 310-68.00C.

Stiff, Bernard. Rotary shaft control apparatus. 4,566,352, Cl. 74-640.000.

Stiff, Bernard. Rotary shaft control apparatus. 4,566,353, Cl. 74-710.500.

Stirling, James F.: *See*—
German, John G.; Benjamin, Abraham; and Stirling, James F., 4,566,336, Cl. 73-772.000.

Stolz, Albert, to Daimler-Benz Aktiengesellschaft. Vehicle air conditioning arrangement. 4,566,531, Cl. 165-42.000.

Stong, Randel E.; and Walinsky, Stanley W., to Pfizer Inc. High temperature drilling fluids. 4,566,978, Cl. 252-8.50C.

Storage Technology Corporation: *See*—
Permut, Ronald, 4,566,652, Cl. 242-189.000.

Story, Arthur L.; and Filshtinsky, Michael, to Norton Christensen, Inc. Coring device with an improved core sleeve and anti-gripping collar with a collective core catcher. 4,566,545, Cl. 175-226.000.

Straubel, Max: *See*—
Bauer, Otto; Eberl, Lernhard; Geyer, Gerhard; and Straubel, Max, 4,566,421, Cl. 123-502.000.

Streeper, Leonard W.; and Chille, Joseph R., to Scott Paper Company. Nonwoven web spreader. 4,566,154, Cl. 19-296.000.

Stretch Forming Corporation: *See*—
Seidentop, Alfred T.; and Johnson, John E., 4,566,693, Cl. 272-144.000.

Stromberg, James L., to Halliburton Company. Quick connect adapter. 4,566,168, Cl. 29-517.000.

Stroomer, Martinus V. C.; and Boekhorst, Frederick M., to U.S. Philips Corporation. Line synchronizing circuit for a picture display device. 4,567,522, Cl. 358-158.000.

Strosberg, Arthur M.: *See*—
Kluge, Arthur F.; Clark, Robin D.; Strosberg, Arthur M.; Pascal, Jean-Claude G.; and Whiting, Roger, 4,567,264, Cl. 544-400.000.

Stroszynski, Joachim: *See*—
Sprintschnik, Gerhard; Niderstatter, Walter; and Stroszynski, Joachim, 4,566,952, Cl. 204-27.000.

Strube, Anneliese: *See*—
Gossler, Werner; Strube, Anneliese; and Zurheide, Manfred, 4,566,173, Cl. 29-571.000.

Struntz, Bernard J. Sports shoe. 4,566,207, Cl. 36-50.000.

Stuber, Fred A.: *See*—
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., 4,567,287, Cl. 560-024.000.

Studiecentrum voor Kernenergie, "S.C.K." : *See*—
Vandeplas, Paul; and Kinnaer, Lucien, 4,566,430, Cl. 126-433.000.

Stuhlmiller, Gary L., to Motorola, Inc. Voltage offset producing circuit for use with a line receiver or the like. 4,567,384, Cl. 307-442.000.

Stumpf, Walter, to Simmons U.S.A. Corporation. Method and apparatus for manufacturing innerspring constructions. 4,566,926, Cl. 156-165.000.

Stunkard, Gerald A. Top entry trunnion ball valve. 4,566,482, Cl. 137-315.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co KG: *See*—
Helmle, Theodor; and Weber, Kurt, 4,566,528, Cl. 165-26.000.

Sudo, Yoshimi: *See*—
Kuwabara, Hideki; and Sudo, Yoshimi, 4,567,208, Cl. 521-59.000.

Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Hauser, Kurt, 4,566,852, Cl. 415-182.000.

Sugai, Saburo: *See*—
Kamano, Yoshiaki; Sugai, Saburo; Okazaki, Tokuji; Yoshida, Seiichiro; and Akaboshi, Sanya, 4,567,172, Cl. 514-179.000.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Shift valve for automatic transmission. 4,566,355, Cl. 74-869.000.

Sugimoto, Keiichi: *See*—
Mizuno, Yukio; and Sugimoto, Keiichi, 4,567,282, Cl. 549-450.000.

Sugimura, Takashi: *See*—
Takamatsu, Satoru; and Sugimura, Takashi, 4,567,358, Cl. 235-379.000.

Sugiura, Manabu: *See*—
Goto, Kunifumi; Sugiura, Manabu; and Suzuki, Shinichi, 4,566,863, Cl. 417-295.000.

Suhara, Hideo: *See*—
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, 4,567,455, Cl. 335-16.000.

Sukopp, Hans, to Ing. Erich Pfeiffer GmbH & Co., Firma. Metering or atomizing pump with a pump casing and an operating pusher. 4,566,611, Cl. 222-153.000.

Sulesky, Donald J.; and Wright, Joseph H., to Polaroid Corporation. Film processor for premounted transparency frames. 4,566,772, Cl. 354-303.000.

Sullivan, Eric C.; and Allford, Daniel W., to Hughes Tool Company - USA. Welding torch with dual gas shielding. 4,567,343, Cl. 219-74.000.

Sullivan, Gilbert: *See*—
Knight, Derek I.; and Sullivan, Gilbert, 4,566,821, Cl. 404-35.000.

Sulzbacher, Horst, to Voest-Alpine Aktiengesellschaft. Process for removing sulfur during melting of pig iron. 4,566,902, Cl. 75-26.000.

Sulzer Brothers Limited: *See*—
Baumeler, Markus, 4,566,273, Cl. 60-415.000.
Bosshard, Ernst, 4,567,015, Cl. 376-272.000.
Schachenmann, Andreas, 4,566,497, Cl. 139-1.00C.

Sumitomo Heavy Industries, Ltd.: *See*—
Terai, Hiroshi, 4,567,541, Cl. 361-235.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Tominaga, Ichiro; and Matsuki, Taketo, 4,567,219, Cl. 524-413.000.

Summerlin, Frederick A. Split cycle engine. 4,566,411, Cl. 123-213.000.

Suncor, Inc.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,566,909, Cl. 127-33.000.

Sundberg, Erik, to Weller Innovation AB. Arrangements in barking machines. 4,566,513, Cl. 144-208.00E.

Sundelin, Kurt G. R., to International Minerals & Chemical Corp. Pyridine, 2,2'-(2-imidazolidinylidene)di-, copper iron and nickel complexes and use in animals. 4,567,173, Cl. 514-188.000.

Sunder, Shyam: *See*—
Peet, Norton P.; and Sunder, Shyam, 4,567,193, Cl. 514-381.000.

Sundstrand Corporation: *See*—
Sims, Cecil, 4,567,422, Cl. 322-25.000.

Sundstrand Data Control, Inc.: *See*—
Bateman, Charles D.; Grove, Michael M.; Noland, Lyle J.; and Ward, Wallace E., 4,567,483, Cl. 340-970.000.

Sung, Rodney L.: *See*—
Karol, Thomas J.; and Sung, Rodney L., 4,566,878, Cl. 44-57.000.

Sunshine, Aoraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Analgesic and anti-inflammatory compositions comprising xanthines and methods of using same. 4,567,183, Cl. 514-264.000.

Sunwa Sharyo Manufacturing Co., Ltd.: *See*—
Misawa, Rintaro, 4,566,550, Cl. 180-8.200.

Surauer, Michael: *See*—
Bittner, Helmut; Gottzein, Eveline; and Surauer, Michael, 4,567,564, Cl. 364-434.000.

Suvanto, Antti, to AB Asea-Atom. Treatment prior to disposal of a sheathing tube of a spent fuel box of a nuclear reactor fuel assembly. 4,566,302, Cl. 72-146.000.
Suwa, Kyoichi: *See*—
Matsuura, Toshio; and Suwa, Kyoichi, 4,566,795, Cl. 356-400.000.
Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,567,060, Cl. 427-87.000.
Suzuki, Atsushi: *See*—
Ninomiya, Masakazu; Fujisawa, Hideya; Omori, Norio; and Suzuki, Atsushi, 4,566,419, Cl. 123-489.000.
Suzuki, Jugoro, to Shimadzu Corporation. Multi-channel spectrophotometric measuring device. 4,566,792, Cl. 356-319.000.
Suzuki, Katsuhiko; and Honda, Takenobu, to Mitsubishi Denki Kabushiki Kaisha. Traction elevator apparatus. 4,566,562, Cl. 187-22.000.
Suzuki, Katsumi: *See*—
Yuasa, Shigeki; Okabayashi, Minahiro; Ohno, Hideki; Suzuki, Katsumi; and Kusumoto, Koshi, 4,567,030, Cl. 423-326.000.
Suzuki, Kazuyoshi: *See*—
Ooi, Kiyoshi; Morita, Michio; Suzuki, Kazuyoshi; Hashizume, Soh; and Yoshizawa, Hanako, 4,567,147, Cl. 435-237.000.
Suzuki, Kenji: *See*—
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.
Suzuki, Kijiro: *See*—
Shiozawa, Kazuo; and Suzuki, Kijiro, 4,566,774, Cl. 354-413.000.
Suzuki, Kunihiko, to Nissan Motor Co., Ltd. Four wheel drive system with center differential unlock control responsive to steering angle. 4,566,554, Cl. 180-249.000.
Suzuki, Masanori: *See*—
Shimada, Yuzo; Utsumi, Kazuaki; Ikeda, Teruyuki; and Suzuki, Masanori, 4,567,542, Cl. 361-321.000.
Suzuki, Saiju: *See*—
Ito, Giichi; Nakano, Ichizo; Shimizu, Yuichi; Mukai, Kosaku; and Suzuki, Saiju, 4,567,347, Cl. 219-124.340.
Suzuki, Shigeru: *See*—
Yoshida, Ryuichi; Suzuki, Shigeru; Koishikawa, Hirotoshi; Miyamoto, Yoshimi; and Kawai, Kazuhide, 4,566,751, Cl. 339-218.00S.
Suzuki, Shinichi: *See*—
Goto, Kunifumi; Sugiura, Manabu; and Suzuki, Shinichi, 4,566,863, Cl. 417-295.000.
Suzuki, Takashi: *See*—
Ohtaka, Keiji; Suzuki, Takashi; Iizuka, Kiyoshi; and Mizutani, Hidemasa, 4,567,123, Cl. 430-4.000.
Suzuki, Toshiaki: *See*—
Matsuse, Kohki; Hashimoto, Hitoshi; and Suzuki, Toshiaki, 4,567,555, Cl. 363-138.000.
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, to Nippondenso Co., Ltd. Fuel injection control apparatus for diesel engines. 4,566,417, Cl. 123-478.000.
Svedala-Arbra AB: *See*—
Lundin, Sven-Ake; and Svensson, Arvid, 4,566,638, Cl. 241-37.000.
Svensson, Arvid: *See*—
Lundin, Sven-Ake; and Svensson, Arvid, 4,566,638, Cl. 241-37.000.
Svensson, Hans T.: *See*—
Skogman, Bengt G.; Svensson, Hans T.; and Torres, Eduardo E., 4,567,088, Cl. 428-213.000.
Swanson, Richard M.: *See*—
Pease, Roger F.; Tuckerman, David B.; and Swanson, Richard M., 4,567,505, Cl. 357-81.000.
Sweeny, Mark F.: *See*—
Gershenson, Meir; Sweeny, Mark F.; Long, Dennis D.; and Fleming, David L., 4,567,438, Cl. 324-248.000.
Swinehart, Grant E.: *See*—
Lottes, Rosanna M.; and Swinehart, Grant E., 4,567,323, Cl. 179-18.00B.
Sydykova, Tokhtobubu C.: *See*—
Ljubman, Nazar Y.; Imangazieva, Gulsara K.; Nugmanova, Lyalya T.; Uskov, Alexandr I.; Sydykova, Tokhtobubu C.; and Kim, Zinaida I., 4,567,207, Cl. 521-35.000.
Sylvian, Alain: *See*—
Bizot, Henri; Dautremont, Jean; and Sylvian, Alain, 4,566,225, Cl. 51-165.720.
Syntex (U.S.A.) Inc.: *See*—
Kluge, Arthur F.; Clark, Robin D.; Strosberg, Arthur M.; Pascal, Jean-Claude G.; and Whiting, Roger, 4,567,264, Cl. 544-400.000.
Synthelabo: *See*—
Bigg, Dennis; Morel, Claude; and Sevrin, Mireille, 4,567,177, Cl. 514-214.000.
Szabo, Laszlo; and Schunemann, Klaus, to International Standard Electric Corporation. Fin-line oscillator. 4,567,450, Cl. 331-107.0DP.
Szajna, John L., to Continental Plastic Containers, Inc. Closure unit including measuring cup. 4,566,509, Cl. 141-381.000.
Tabacco, Alessandro; Tarli, Paolo; and Neri, Paolo, to Sclavo, S.p.A. Method for determining transferrin and composition therefor. 4,567,150, Cl. 436-87.000.
Tabata, George K., to Discovision Associates. Vertical interval signal encoding under SMPTE control. 4,567,531, Cl. 358-335.000.
Tabata, Hiroshi; and Kai, Yasuaki, to Nissan Motor Co., Ltd. Nonreflective and limitatively light-transmitting board. 4,567,082, Cl. 428-138.000.
Tachibana, Kanichi: *See*—
Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, 4,567,403, Cl. 315-47.000.
Tachikawa Spring Co., Ltd.: *See*—
Yanagisawa, Hiroshi, 4,566,667, Cl. 248-561.000.
Tada, Sugihiko: *See*—
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.
Tadokoro, Tomoo; Shiraishi, Hideo; and Okimoto, Haruo, to Mazda Motor Corporation. Intake system for rotary piston engine. 4,566,412, Cl. 123-216.000.
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, to Mazda Motor Corporation. Fuel intake system for a supercharged engine. 4,566,422, Cl. 123-559.000.
Tahara, Akinori: *See*—
Yasuda, Yasushi; Enomoto, Hiromu; Shimauchi, Yoshiki; and Tahara, Akinori, 4,567,380, Cl. 307-290.000.
Taisei Corporation: *See*—
Ito, Yasuro; and Higuchi, Yoshiro, 4,566,799, Cl. 366-1.000.
Taiyo Shokai Co., Ltd.: *See*—
Watanabe, Hideyuki; and Ichikawa, Yoshimitu, 4,566,252, Cl. 53-410.000.
Taiyo Yuden Co., Ltd.: *See*—
Yamaoka, Nobutatsu; and Sasazawa, Kazuo, 4,567,059, Cl. 427-79.000.
Takabe, Katsunori: *See*—
Umeda, Yasukazu; and Takabe, Katsunori, 4,567,558, Cl. 364-148.000.
Takagi, Hiroshi: *See*—
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.
Takahashi, Hiroto: *See*—
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,567,493, Cl. 346-140.00R.
Takahashi, Osamu: *See*—
Nitou, Hiroyasu; Shirai, Kiyoshi; and Takahashi, Osamu, 4,566,425, Cl. 123-600.000.
Takahashi, Shunji: *See*—
Yamamoto, Minato; and Takahashi, Shunji, 4,566,418, Cl. 123-479.000.
Takahashi, Takamasa: *See*—
Shinoda, Morimasa; and Takahashi, Takamasa, 4,567,506, Cl. 358-11.000.
Takahashi, Yoshimi: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Takahashi, Yoshimi; Hoshi, Akira; and Mizutani, Uichiro, 4,566,323, Cl. 73-295.000.
Takamatsu, Satoru; and Sugimura, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic teller system. 4,567,358, Cl. 235-379.000.
Takamizawa, Minoru; Yamamoto, Akira; and Nagura, Shigehiro, to Shin-Etsu Chemical Co., Ltd. Substituted polyacetylene copolymer. 4,567,245, Cl. 526-279.000.
Takamura, Yuji: *See*—
Akisada, Masahide; Ookawa, Norio; and Takamura, Yuji, 4,566,767, Cl. 354-76.000.
Takashima, Satoshi: *See*—
Akanuma, Shigetake; Nakajima, Minoru; Takashima, Satoshi; Imamura, Haruo; Ojiro, Yoshitaka; Kakuta, Hiroshi; and Matsumoto, Masato, 4,566,736, Cl. 299-23.000.
Takatsuka, Takuo: *See*—
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, 4,567,455, Cl. 335-16.000.
Takayama, Makoto; Muramoto, Tomotaka; and Nishimura, Akimasa, to Canon Kabushiki Kaisha. Television camera with color balance. 4,567,509, Cl. 358-29.000.
Takeda Chemical Industries, Ltd.: *See*—
Mizuno, Yukio; and Sugimoto, Keiichi, 4,567,282, Cl. 549-450.000.
Nohara, Akira; and Maki, Yoshitaka, 4,567,201, Cl. 514-571.000.
Takeda, Mikio; Oh-ishi, Tokuro, Nakajima, Hiromichi; and Nagao, Taku, to Tanabe Seiyaku Co., Ltd. 8-Chloro-1,5-benzothiazepine derivatives. 4,567,175, Cl. 514-211.000.
Takeda, Yoshimitsu: *See*—
Moriya, Masaichi; Mochida, Haruo; and Takeda, Yoshimitsu, 4,566,576, Cl. 192-84.00C.
Takei, Kenji; and Akabane, Yukihiro, to Nippon Seiko Kabushiki Kaisha. Sealing means for a bearing for strut-type suspension. 4,566,812, Cl. 384-484.000.
Takeichi, Kenzo: *See*—
Takemoto, Akinobu; Takeichi, Kenzo; Yabe, Yuhiko; and Yoshikawa, Yoshiaki, 4,567,418, Cl. 318-685.000.
Takemoto, Akinobu; Takeichi, Kenzo; Yabe, Yuhiko; and Yoshikawa, Yoshiaki, to Hitachi, Ltd. Operation control apparatus for robots. 4,567,418, Cl. 318-685.000.
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Itoh, Hisao; Fuse, Mario; and Nakamura, Takeshi, to Fuji Xerox Co., Ltd. Photoelectric converting device with a plurality of divided electrodes. 4,567,374, Cl. 250-578.000.
Takenouchi, Toru, to Noritsu Kenkyu Center Co., Ltd. Magazine for supplying a strip of photographic printing paper. 4,566,785, Cl. 355-72.000.
Takeuchi, Hirosato; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Spontaneous circulation type solar heat collector. 4,566,431, Cl. 126-437.000.
Takeuchi, Kiyoshi, to Nissan Motor Co., Ltd. Washer type pressure sensor. 4,566,316, Cl. 73-754.000.
Takimoto, Masahiro: *See*—
Yamazaki, Yoshio; Takimoto, Masahiro; and Ohta, Satoshi, 4,567,217, Cl. 524-296.000.

Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,567,497, Cl. 346-200.000.

Tamaru, Shigemi: *See—*
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, 4,567,455, Cl. 335-16.000.

Tamura, Hifumi: *See—*
Ishitani, Tohru; Tamura, Hifumi; and Shimase, Akira, 4,567,398, Cl. 313-362.100.

Tamura, Kimio: *See—*
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.

Tamura, Masuhiko: *See—*
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.

Tamura, Motonori: *See—*
Nagano, Kyoichi; Naganuma, Hiroshi; Shinada, Koichi; Tamura, Motonori; and Soneda, Shigenobu, 4,566,916, Cl. 148-26.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Takeda, Mikio; Oh-ishi, Tokuro; Nakajima, Hiromichi; and Nagao, Taku, 4,567,175, Cl. 514-211.000.

Tanaka, Hideo: *See—*
Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, 4,566,996, Cl. 260-239.00A.

Tanaka, Nobuyoshi; Hashimoto, Seiji; and Kuwayama, Tetsuro, to Canon Kabushiki Kaisha. Solid state color imaging apparatus. 4,567,510, Cl. 358-44.000.

Tanaka, Shinichi, to Sharp Kabushiki Kaisha. Modulation circuit of a digital-to-analog converter. 4,567,468, Cl. 340-347.0DA.

Tanaka, Taku: *See—*
Maruyama, Hitoshi; Tanaka, Taku; and Okaya, Takuji, 4,567,221, Cl. 524-436.000.

Tanaka, Toshie: *See—*
Hara, Kunio; Tanaka, Toshie; Shibayama, Teruji; Morisaki, Minoru; and Kaneko, Yoshio, 4,566,924, Cl. 156-73.500.

Tanaka, Yoshikazu: *See—*
Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,566,354, Cl. 74-866.000.

Taniguchi, Satoru; Nishibayashi, Hideo; and Uemura, Masahiro, to Nippon Colin Co., Ltd. Apparatus for automatically measuring blood pressure. 4,566,463, Cl. 128-682.000.

Tanimoto, Akira: *See—*
Hashimoto, Shintaro; and Tanimoto, Akira, 4,567,573, Cl. 364-900.000.

Tanino, Hiroshi; Okamoto, Tetsuhiko; and Ueyama, Shinichiro, to Shin Nisso Kako Co., Ltd. Process for the preparation of phosphonitrile chloride oligomer. 4,567,028, Cl. 423-300.000.

Tanishi, Tokio; and Yokoyama, Hideki, to Matsushita Electric Works, Ltd. Connector. 4,566,748, Cl. 339-95.00D.

Tapio, Olli: *See—*
Koponen, Martti; and Tapio, Olli, 4,566,946, Cl. 162-359.000.

Tapmatic Corporation: *See—*
Johnson, Allan S., 4,566,829, Cl. 408-239.00R.

Tappe, Horst: *See—*
Buhler, Ulrich; Tappe, Horst; Bode, Albert; Hahnke, Manfred; and Roth, Kurt, 4,567,252, Cl. 534-882.000.

Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Hydraulic drive for multi-color sheet-fed rotary printing machines. 4,566,385, Cl. 101-183.000.

Taprogge Gesellschaft mbH: *See—*
Bochinski, Rolf; Eimer, Klaus; Littek, Harald; and Nasse, Johannes, 4,566,533, Cl. 165-95.000.

Tarli, Paolo: *See—*
Tabacco, Alessandro; Tarli, Paolo; and Neri, Paolo, 4,567,150, Cl. 436-87.000.

Tasaki, Yasutaka: *See—*
Itatani, Hiroshi; Kashima, Mikito; and Tasaki, Yasutaka, 4,567,280, Cl. 549-43.000.

Tate & Lyle Public Limited Company: *See—*
Lindley, Michael G., 4,567,053, Cl. 426-538.000.

Tateyama, Tom: *See—*
Herota, Rosh N., 4,566,356, Cl. 81-62.000.

Tawara, Yoshio; Ohashi, Ken; and Kikuchi, Hideaki, to Shin-Etsu Chemical Co., Ltd. Method for producing a magnetic bias field. 4,567,576, Cl. 365-2.000.

Taylor, Barry E., to Du Pont de Nemours, E. I., and Company. Binder glass of Bi_2O_3-SiO_2-GeO_2 (-PbO optional) admixed with ZnO/ZnO and Bi_2O_3 . 4,567,151, Cl. 501-15.000.

Taylor, Bret K., to Hewlett-Packard Company. Nozzle cleaning, priming and capping apparatus for thermal ink jet printers. 4,567,494, Cl. 346-140.00R.

Taylor, Julian S.; and Taylor, Wesley L. Soft seat for safety valve. 4,566,486, Cl. 137-469.000.

Taylor, Wesley L.: *See—*
Taylor, Julian S.; and Taylor, Wesley L., 4,566,486, Cl. 137-469.000.

TBT Tiefbohrtechnik GmbH & Co. KG: *See—*
Jenny, Werner, 4,566,705, Cl. 279-4.000.

TDK Corporation: *See—*
Arioka, Hiroyuki; Nishimatsu, Masaharu; and Watanabe, Akio, 4,567,083, Cl. 428-141.000.

TDS, Inc.: *See—*
Shu, David F., 4,567,318, Cl. 174-35.0GC.

Technology Research Corporation: *See—*
Legatti, Raymond H., 4,567,456, Cl. 335-20.000.

Tekmar Angewandte Elektronik GmbH & Co. KG: *See—*
Latarius, Hans R., 4,566,628, Cl. 237-8.00C.

Tektronix, Inc.: *See—*
Bauer, Charles E.; and Bold, William A., 4,566,186, Cl. 29-852.000.
Bos, Philip J., 4,566,758, Cl. 350-346.000.
Bristol, Lloyd R., 4,567,405, Cl. 315-392.000.
VanHorne, Arthur C., 4,567,081, Cl. 428-138.000.

Telefonaktiebolaget LM Ericsson: *See—*
Berg, Bengt O., 4,567,445, Cl. 330-300.000.

Temco Products Corporation: *See—*
Wolin, Dale, 4,567,474, Cl. 340-584.000.

Temple, John D.: *See—*
Ashworth, Roger A.; Aiston, Brian E.; and Temple, John D., 4,566,161, Cl. 24-642.000.

Teng, Daniel M.: *See—*
Semp, Bernard A.; and Teng, Daniel M., 4,566,469, Cl. 131-308.000.

Tennant, William M.: *See—*
Flotow, Richard A.; and Tennant, William M., 4,566,572, Cl. 192-70.120.

Terachi, Junichi: *See—*
Hosogai, Setsuo; Fujii, Hiroshi; Tamaru, Shigemi; Terachi, Junichi; Takatsuka, Takuo; and Suhara, Hideo, 4,567,455, Cl. 335-16.000.

Terai, Hiroshi, to Sumitomo Heavy Industries, Ltd. Electric power source for use in electrostatic precipitator. 4,567,541, Cl. 361-235.000.

Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem and cepham compounds and processes for preparation thereof. 4,567,275, Cl. 548-128.000.

Tershak, Andrew T.; and Thieneman, Michael D., to Whirlpool Corporation. Refrigerator door ajar alarm with variable delay. 4,566,285, Cl. 62-129.000.

Terumo Kabushiki Kaisha: *See—*
Fujii, Tadashi; and Hayakawa, Yoshinori, 4,566,330, Cl. 73-599.000.

Tetra Pak International AB: *See—*
Rausing, Hans A., 4,566,928, Cl. 156-217.000.

Texaco Inc.: *See—*
Friedman, Robert H., 4,566,964, Cl. 208-8.0LE.
Karol, Thomas J.; and Sung, Rodney L., 4,566,878, Cl. 44-57.000.

Texas Instruments Incorporated: *See—*
Buol, Douglas A.; Mize, Dean N.; Pattschull, John W.; and Wallace, Robert M., 4,567,432, Cl. 324-158.00F.
Hornbeck, Larry J., 4,566,935, Cl. 156-626.000.
McGregor, Douglas D., 4,567,439, Cl. 324-304.000.
Oliver, Arthur B., 4,567,577, Cl. 365-156.000.
Patel, Pravin P.; and Reddy, Chitranjan N., 4,567,579, Cl. 365-189.000.
Pundarika, Eshwarahalli S., 4,567,395, Cl. 310-338.000.
Smayling, Michael C.; and Duane, Michael P., 4,566,175, Cl. 29-576.00B.

Theobald, Hans: *See—*
Eicken, Karl; Scheib, Klaus; Theobald, Hans; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,567,263, Cl. 544-263.000.

Theodore, Chris P., to Cars & Concepts, Inc. Hatchback vehicle body including hatch having opening with soft top convertible closure. 4,566,728, Cl. 296-76.000.

Therrien, Keith E., to Boeing Company, The. Composite material structure with integrated insulating blanket and method of manufacture. 4,567,076, Cl. 428-102.000.

Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus and method for receiving and transporting an assembled track section. 4,566,389, Cl. 104-3.000.

Theuwis, Alfons L.; and Maes, Joseph M., to Electro-Nite Co. Sampling and/or measuring apparatus for immersion in molten metal. 4,566,343, Cl. 73-864.590.

Thieneman, Michael D.: *See—*
Tershak, Andrew T.; and Thieneman, Michael D., 4,566,285, Cl. 62-129.000.

Thissen, Klaus; and Barzantny, Joachim, to Interatom Internationale Atomreaktorbau GmbH. Method for carrying liquid metal by two series-connected electric magnet pumps. 4,566,859, Cl. 417-50.000.

Thoma, Nandor G.: *See—*
Wyatt, Virgil D.; Kraft, Wayne R.; and Thoma, Nandor G., 4,567,561, Cl. 364-200.000.

Thomas, Francis, to Societe Industrielle de Bellevaux, SIBEL. Programmer. 4,566,347, Cl. 74-125.000.

Thomson-CSF: *See—*
Bert, Alain; and Camiade, Marc, 4,567,449, Cl. 331-56.000.
Castera, Jean P.; and Meunier, Paul L., 4,566,329, Cl. 73-597.000.
Mourier, Georges, 4,567,402, Cl. 315-39.300.
Richard, Christian, 4,567,519, Cl. 358-135.000.

Thomson CSF-Telephone: *See—*
Lecomte, Daniel; and Gibaud, Michel, 4,567,589, Cl. 370-58.000.

Thornton, Kenneth R.: *See—*
O'Brien, Robert N.; McOrmond, Philip M.; Hocking, Martin B.; and Thornton, Kenneth R., 4,566,315, Cl. 73-61.400.

Throndson, Roger L.: *See—*
Greenwood, Arthur R.; Burgard, Jeffrey E.; and Throndson, Roger L., 4,567,023, Cl. 422-192.000.

Thurston, George B. Device and method of measuring the viscosity and/or visco-elasticity of a fluid. 4,566,314, Cl. 73-55.000.

Thwaites, Michael J.: *See—*
Hockley, Peter J.; and Thwaites, Michael J., 4,567,499, Cl. 357-2.000.

Thyssen, Jeffrey: *See—*
Miller, Jule A.; Lee, Jack W.; and Thyssen, Jeffrey, 4,566,939, Cl. 156-655.000.

Tice, Victor M.: *See—*
Ronemus, DeHertburn N.; and Tice, Victor M., 4,567,344, Cl. 361-399.000.

Timberline Geodesics, Inc.: *See—*
Schwartz, Victor M.; and Miller, Robert G., 4,566,818, Cl. 403-172.000.

Timmis, Peter H.: *See—*
Ballard, John R.; Timmis, Peter H.; and Buller, Michael J., 4,566,270, Cl. 60-264.000.

Tindall, William N. J.: *See—*
Saade , Henry Y.; and Tindall, William N. J., 4,567,574, Cl. 364-900.000.

Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and deWitt, Paolo, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Esters of mercapto acyl-carnitines and pharmaceutical compositions containing same. 4,567,200, Cl. 514-547.000.

Toa Harbor Works Co., Ltd.: *See—*
Hirai, Yoshihisa; Shima, Masanori; and Aoki, Hirohiko, 4,566,825, Cl. 405-267.000.

Tobita, Etsuko: *See—*
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.

Toda, Toshiyuki, to Kotobuki Engineering & Manufacturing Co., Ltd. Screw decanter type centrifugal concentrating machine. 4,566,873, Cl. 494-53.000.

Todd Jr., Alvin E. Compact high flow rate electric instantaneous water heater. 4,567,350, Cl. 219-298.000.

Todd, Stephen J.: *See—*
Siegel, Paul H.; and Todd, Stephen J., 4,567,464, Cl. 340-347.0DD.

Tohoku Ricoh Co., Ltd.: *See—*
Kumano, Masafumi; Kawashima, Ikue; Hirama, Masayuki; and Tsuji, Yasuhiro, 4,566,453, Cl. 128-303.100.

Tohoku Steel Co., Ltd.: *See—*
Sawada, Takeshi; Shinmi, Akira; Takagi, Hiroshi; Suzuki, Kenji; Kishi, Fumio; and Kozuki, Susumu, 4,567,116, Cl. 428-694.000.

Tohyama, Shigeo, to Hitachi, Ltd. Recording apparatus for a spectrophotometer. 4,566,793, Cl. 356-319.000.

Tokai Electric Wire Company Limited: *See—*
Yoshida, Ryuichi; Suzuki, Shigeru; Koishikawa, Hirotoshi; Miyamoto, Yoshimi; and Kawai, Kazuhide, 4,566,751, Cl. 339-218.00S.

Tokuyama Soda Kabushiki Kaisha: *See—*
Yuasa, Shigeki; Okabayashi, Minahiro; Ohno, Hideki; Suzuki, Katsumi; and Kusumoto, Koshi, 4,567,030, Cl. 423-326.000.

Tokyo Juki Industrial Co., Ltd: *See—*
Sakuma, Kuniharu; and Goto, Sumio, 4,566,396, Cl. 112-302.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Inagawa, Jun; Nagumo, Masahide; and Kojima, Tadashi, 4,567,568, Cl. 364-761.000.
Kano, Masaaki; Yamaji, Hiroshi; Nakao, Shinji; and Okumura, Katsuya, 4,567,364, Cl. 250-307.000.
Konishi, Kuniyoshi, 4,567,446, Cl. 330-308.000.
Kusakabe, Tetsuo; Sakai, Tetsuro; and Honda, Kazuhiko, 4,567,507, Cl. 358-11.000.
Nakagawa, Akio; Utagawa, Tadashi; and Tsukakoshi, Tsuneo, 4,567,502, Cl. 357-53.000.
Sato, Yasuji; Yamamoto, Takao; Sano, Yoshikazu; and Nakayama, Yasunobu, 4,567,326, Cl. 179-90.00B.
Takamatsu, Satoru; and Sugimura, Takashi, 4,567,358, Cl. 235-379.000.
Yasuda, Seiji; Koshino, Yutaka; and Yonezawa, Toshio, 4,566,174, Cl. 29-576.00W.

Tokyo Shisetsu Kogyo Kabushiki Kaisha: *See—*
Kumasako, Takeo; Sato, Kiyomi; Kawakatsu, Akira; Sato, Akinori; and Mamiya, Isamu, 4,566,471, Cl. 131-317.000.

Tomihashi, Nobuyuki: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,566,755, Cl. 350-96.340.

Tominaga, Ichiro; and Matsuki, Taketo, to Sumitomo Rubber Industries, Ltd. Composition for cover of golf balls. 4,567,219, Cl. 524-413.000.

Tomita, Fusao: *See—*
Shimada, Kenjiro; Otomo, Masao; Tomita, Fusao; and Ito, Shingo, 4,567,164, Cl. 514-33.000.

Tomita, Masao, to Kinki Denki Co., Ltd. Dynamic current interruption-type indicators and method therefor. 4,566,401, Cl. 116-207.000.

Tomita, Yogi; Yamamoto, Hisashi; and Kitagawa, Susumu, to Kanebo Limited. Method for cleaning article by scrubbing with cleaning roll. 4,566,911, Cl. 134-6.000.

Tomizawa, Fumio: *See—*
Iwatsuka, Nobuyoshi; Tomizawa, Fumio; Sato, Chikara; Ozaki, Norihiko; Ichikawa, Yoshiaki; and Sadakane, Kenichiro, 4,566,843, Cl. 414-680.000.

Tomono, Hiromi; Kokubo, Takashi; Yamaguchi, Kazuki; and Ikuma, Sadao, to Mitsubishi Monsanto Chemical Company. Heat and impact resistant resin composition. 4,567,233, Cl. 525-71.000.

Tong, Long S. Venting means for nuclear reactors. 4,567,016, Cl. 376-283.000.

Toray Industries, Inc.: *See—*
Hasegawa, Katsumi; and Kanamori, Hiromitsu, 4,566,643, Cl. 242-18.00R.
Matsumoto, Katsutoshi, 4,566,384, Cl. 101-170.000.
Yamazaki, Chikayasu; Torikai, Jun; and Kumo, Ichiro, 4,566,319, Cl. 73-160.000.

Torigai, Katsumi: *See—*
Iwai, Tomio; and Torigai, Katsumi, 4,566,415, Cl. 123-361.000.

Torii, Sigeru; Tanaka, Hideo; Shiroi, Takashi; Sasaoka, Michio; Saito, Norio; and Matsumura, Kiyotoshi, to Otsuke Kagaku Yakuhin Kabushiki Kaisha. Process for preparing azetidinone derivatives. 4,566,996, Cl. 260-239.00A.

Torikai, Jun: *See—*
Yamazaki, Chikayasu; Torikai, Jun; and Kumo, Ichiro, 4,566,319, Cl. 73-160.000.

Torres, Eduardo E.: *See—*
Skogman, Bengt G.; Svensson, Hans T.; and Torres, Eduardo E., 4,567,088, Cl. 428-213.000.

Torrington Company, The: *See—*
Moseley, John B., 4,566,191, Cl. 33-1.00M.

Toshishige, Yoshinori, to Reliance Incorporated. Bath accessories, and decorative wall flanges thereof. 4,566,662, Cl. 248-222.100.

Toussaint, Rene : *See—*
Wilhelm, Dieter; Schlagheck, Werner; and Toussaint, Rene , 4,567,397, Cl. 313-318.000.

Tovrog, Benjamin S.; Hoppin, Charles R.; and Johnson, Bryce V., to Standard Oil Company (Indiana). Olefin polymerization catalyst system producing polymer with low active chloride. 4,567,155, Cl. 502-123.000.

Towmotor Corporation: *See—*
Wiblin, Wayne T.; Melocik, Grant C.; Leskovec, Edward V.; and Pickering, William, 4,567,467, Cl. 340-347.00P.

Town, Michael H.: *See—*
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,567,195, Cl. 514-419.000.

Towner, Janet M.: *See—*
van de Ven, Everhardus P. G. T.; and Towner, Janet M., 4,566,177, Cl. 29-590.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Yoneda, Fumio, 4,567,260, Cl. 544-250.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.

Toyoda Gosei Co., Ltd.: *See—*
Sasaki, Koji; and Koizumi, Junji, 4,567,235, Cl. 525-113.000.
Sasaki, Koji; and Koizumi, Junji, 4,567,238, Cl. 525-179.000.
Yamazaki, Yoshio; Takimoto, Masahiro; and Ohta, Satoshi, 4,567,217, Cl. 524-296.000.

Toyoda, Shigehiro: *See—*
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,566,521, Cl. 164-160.100.

Toyota Jidosha Kabushiki Kaisha: *See—*
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,566,348, Cl. 74-359.000.
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.

Traber, Walter: *See—*
Gehret, Jean-Claude; and Traber, Walter, 4,567,190, Cl. 514-343.000.

Trabert, Ludwig: *See—*
Grigo, Ulrich; Kohler, Karl-Heinz; Binsack, Rudolf; Morbitzer, Leo; Merten, Josef; Trabert, Ludwig; and Heitz, Walter, 4,567,226, Cl. 524-538.000.

Trachte, Dietrich, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,566,635, Cl. 239-533.800.

Transamerica Delaval Inc.: *See—*
Zacchio, Joseph M., 4,566,321, Cl. 73-290.00R.

Traub, Henry A., to W. S. Shamban & Company. Seal assembly with improved low pressure sealing ring. 4,566,702, Cl. 277-121.000.

Treiber, Helmut: *See—*
Fursich, Manfred; Treiber, Helmut; Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,566,786, Cl. 355-77.000.

Tremag Trennmaschinen-Gesellschaft mbH: *See—*
Ehm, Karl H.; and Orendi, Roderich R., 4,566,679, Cl. 269-23.000.

Trio Corporation: *See—*
Cavanaugh, Glenn L.; and Raffield, William C., 4,566,397, Cl. 114-56.000.

Trocciola, John C., to United Technologies Corporation. Use of gas depolarized anodes for the electrochemical production of adiponitrile. 4,566,957, Cl. 204-73.00A.

Troup, Alan P.: *See—*
Bukowiecki, Stanislaw; Pfister, Gustav; Reis, Alfons; Troup, Alan P.; and Ulli, Hans-Peter, 4,567,475, Cl. 340-634.000.

Trumble, William P., to Bell Canada. Pressure impregnation of wood poles for preservation. 4,567,115, Cl. 428-541.000.

Trummlitz, Gunter: *See—*
Eberlein, Wolfgang; Trummlitz, Gunter; Engel, Wolfhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,567,178, Cl. 514-215.000.

TRW Inc.: *See—*
Barker, Charles A.; and Rau, Jim L., 4,566,477, Cl. 137-101.000.
Fleming, William J.; and Raceu, Dumitru, 4,566,338, Cl. 73-862.360.

Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Clutch release device for motorized cycles. 4,566,577, Cl. 192-85.0CA.
Tsuboi, Shunji: *See*—
Kobayashi, Toyohiro; Mochizuki, Shoji; Murata, Mitsuru; Tsuboi, Shunji; and Sakurai, Hideto, 4,566,813, Cl. 400-120.000.
Tsubokawa, Yoshitoki: *See*—
Sarasue, Hirotaka; and Tsubokawa, Yoshitoki, 4,566,156, Cl. 24-398.000.
Tsuchiya, Eiichi, to Victor Company of Japan, Ltd. Adapter for a miniature type tape cassette. 4,567,536, Cl. 360-94.000.
Tsuchiya, Kazumichi, to Fuji Photo Optical Co., Ltd. Servo control circuit module for use in a television camera. 4,567,526, Cl. 358-227.000.
Tsuda, Shin, to Canon Kabushiki Kaisha. Facsimile apparatus. 4,567,322, Cl. 179-2.00A.
Tsuji, Shintaro: *See*—
Araya, Shinji; and Tsuji, Shintaro, 4,567,566, Cl. 364-554.000.
Tsuji, Yasuhiro: *See*—
Kumano, Masafumi; Kawashima, Ikue; Hirama, Masayuki; and Tsuji, Yasuhiro, 4,566,453, Cl. 128-303.100.
Tsukakoshi, Tsuneo: *See*—
Nakagawa, Akio; Utagawa, Tadashi; and Tsukakoshi, Tsuneo, 4,567,502, Cl. 357-53.000.
Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Exposure control apparatus based on a multimetering system. 4,566,775, Cl. 354-432.000.
Tsunoda, Teruo; Numauchi, Hiromitsu; Kurata, Hironobu; Kawaguchi, Yoichi; Ishii, Satoshi; Seki, Masanori; Iwasaki, Masahiro; and Enomoto, Fukumasa, to Komori Printing. Press plate positioning apparatus for automatic drawing machine. 4,566,194, Cl. 33-18.100.
Tsuruta, Hidemasa. Method of separating a mixed liquid into light and heavy fractions by distillation. 4,566,947, Cl. 203-26.000.
Tsuzuki, Yoshihiko: *See*—
Suzuki, Yutaka; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Naito, Takashi; Kumano, Mikio; Nakamura, Tetsuya; Haseda, Satoshi; and Masuda, Akira, 4,566,417, Cl. 123-478.000.
Tucker, Hartwell F.; Tucker, Jeffrey R.; Ross, Dennis; and Knirck, Jeffrey G., to Octa, Inc. Permanent magnet disc rotor machine. 4,567,391, Cl. 310-156.000.
Tucker, Jeffrey R.: *See*—
Tucker, Hartwell F.; Tucker, Jeffrey R.; Ross, Dennis; and Knirck, Jeffrey G., 4,567,391, Cl. 310-156.000.
Tuckerman, David B.: *See*—
Pease, Roger F.; Tuckerman, David B.; and Swanson, Richard M., 4,567,505, Cl. 357-81.000.
Tummino, John, to Clinton Industries, Inc. Sewing machine needle thread capturing and severing mechanism. 4,566,395, Cl. 112-292.000.
Turner, Patrick E., to Goodyear Aerospace Corporation. Armored panel. 4,566,237, Cl. 52-269.000.
Turner Quick Lift Corporation: *See*—
Van Denberg, Ervin K., 4,566,719, Cl. 280-711.000.
Turtschan, Alfons; and Drechsler, Herbert, to Gasti-Verpackungsmaschinen GmbH. Multiple packaging device. 4,566,591, Cl. 206-427.000.
Turunen, Olli: *See*—
Eklund, Vidar; Ekman, Kurt; Turunen, Olli; Huttunen, Jouko; Selin, Johan-Fredrik; and Fors, Jan, 4,567,255, Cl. 536-30.000.
Tverezy, Jury F.: *See*—
Goriov, Viktor M.; Kiselev, Evgeny I.; Levin, Alexandr G.; Kutovoi, Valentin I.; Tverezy, Jury F.; and Spivak, Igor V., 4,566,587, Cl. 198-732.000.
Tyler, Arnold L.: *See*—
Borio, Donald C.; Borio, Richard W.; Hale, Gilbert L.; Mehta, Arun K.; and Tyler, Arnold L., 4,566,394, Cl. 110-347.000.
UBE Industries, Ltd.: *See*—
Itatani, Hiroshi; Kashima, Mikito; and Tasaki, Yasutaka, 4,567,280, Cl. 549-43.000.
Uchida, Akio: *See*—
Ohtagaki, Yoshio; Ochi, Masafumi; Masui, Motonobu; Tachibana, Kanichi; and Uchida, Akio, 4,567,403, Cl. 315-47.000.
Uchida, Katsumi: *See*—
Sogabe, Yoji; Uchida, Katsumi; and Harada, Kunihiko, 4,567,093, Cl. 428-250.000.
Uehara, Haruo, to Canon Kabushiki Kaisha. Process for producing optical members. 4,566,930, Cl. 156-280.000.
Uehara, Katsuharu: *See*—
Miyagi, Masahiro; Uehara, Katsuharu; Nozawa, Yoshio; and Deguchi, Takahiko, 4,566,359, Cl. 83-23.000.
Uematsu, Tomoe: *See*—
Nagato, Nobuyuki; Maki, Kenichiro; Uematsu, Tomoe; and Ishioka, Ryoji, 4,567,292, Cl. 560-245.000.
Uemura, Masahiro: *See*—
Taniguchi, Satoru; Nishibayashi, Hideo; and Uemura, Masahiro, 4,566,463, Cl. 128-682.000.
Ueyama, Shinichiro: *See*—
Tanino, Hiroshi; Okamoto, Tetsuhiko; and Ueyama, Shinichiro, 4,567,028, Cl. 423-300.000.
Uhde GmbH: *See*—
Huber, Johann; and Lorenz, Lutz, 4,566,722, Cl. 285-18.000.
Uittenbogaard, Teunis H.: *See*—
Moors, Petrus M. A. W.; and Uittenbogaard, Teunis H., 4,566,176, Cl. 29-578.000.
Ulli, Hans-Peter: *See*—
Bukowiecki, Stanislaw; Pfister, Gustav; Reis, Alfons; Troup, Alan P.; and Ulli, Hans-Peter, 4,567,475, Cl. 340-634.000.
Umeda, Yasukazu; and Takabe, Katsunori, to Mitsubishi Denki Kabushiki Kaisha. Elevator traffic demand analyzing system. 4,567,558, Cl. 364-148.000.
Umemura, Shinichiro; Katakura, Kageyoshi; and Ogawa, Toshio, to Hitachi, Ltd. Ultrasonic diagnosis system. 4,566,459, Cl. 128-660.000.
Umezawa, Hamao; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. N-Methanesulfonic acid derivatives of 3-demethoxyistamycin B. 4,567,165, Cl. 514-36.000.
Umezu, Hideo. Plastic insert-mold element containing a metal-piece insert. 4,566,750, Cl. 339-126.00R.
Underwater Storage Limited: *See*—
Hickey, Christopher D. D., 4,566,367, Cl. 89-1.810.
Uneyama, Yoshihisa: *See*—
Iizuka, Kenichi; Uzuhashi, Hideo; Uneyama, Yoshihisa; Matuda, Michiya; and Kobayashi, Minoru, 4,566,289, Cl. 62-228.400.
Ungar, Israel S.: *See*—
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., 4,567,087, Cl. 428-211.000.
Union Camp Corporation: *See*—
Firth, William C., Jr., 4,566,896, Cl. 71-24.000.
Union Carbide Corporation: *See*—
Hatfield, James C., 4,566,977, Cl. 252-8.50C.
Qureshi, Shahid; and Gardner, Hugh C., 4,567,216, Cl. 523-400.000.
Sara, Raymond V., 4,567,103, Cl. 428-408.000.
Wilson, Stephen T.; and Flanigen, Edith M., 4,567,029, Cl. 423-306.000.
Union Oil Company of California: *See*—
Robinson, Paul R.; and Moorehead, Eric L., 4,567,314, Cl. 585-621.000.
United Aircraft Products, Inc.: *See*—
Gooden, Richmond A., 4,566,530, Cl. 165-36.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Baldry, Peter J.; Collins, John H.; Morantz, Daniel J.; Overton, Terence K. W.; and Wright, David W., 4,567,122, Cl. 430-4.000.
Irvine, Stuart J. C.; Mullin, John B.; and Giess, Jean, 4,566,918, Cl. 148-175.000.
Knight, Derek I.; and Sullivan, Gilbert, 4,566,821, Cl. 404-35.000.
McDonnell, Damien G.; and Smith, Robert A., 4,566,759, Cl. 350-346.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See*—
Rosser, Robert W.; Chen, Timothy S.; and Cheng, Chung-Heng, 4,567,301, Cl. 564-243.000.
Army: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,566,760, Cl. 350-358.000.
Hoffmeister, Lawrence D., 4,566,609, Cl. 222-130.000.
Energy: *See*—
Goldberg, David A.; Flood, William S.; Arthur, Allan A.; and Voelker, Ferdinand, 4,567,452, Cl. 332-7.000.
Pitts, John R., 4,566,937, Cl. 156-628.000.
Vaidyanathan, Swaminathan; and Adamson, Martyn G., 4,567,017, Cl. 376-417.000.
National Aeronautics and Space Administration: *See*—
Deis, Bert C., 4,566,447, Cl. 128-80.00E.
Hergenrother, Paul M.; and Havens, Stephen J., 4,567,240, Cl. 525-328.100.
Smith, Hubert E.; Wall, William A.; and Burns, Morrison R., Jr., 4,567,348, Cl. 219-124.340.
National Security Agency: *See*—
Morris, S. Brent; and Wisniewski, Richard A., 4,567,572, Cl. 364-900.000.
Navy: *See*—
Adams, Theodore C., Jr.; and Adolph, Horst G., 4,567,296, Cl. 564-111.000.
Barnett, Larry R.; Lau, Yue-Ying; Chu, Kwo R.; and Granatstein, Victor L., 4,567,401, Cl. 315-5.000.
DiGiovanniantonio, Perry R.; and Zimmer, William J., 4,566,658, Cl. 244-110.00R.
Luckachina, John C., 4,566,659, Cl. 244-137.00R.
Metcalf, Travis W., 4,567,609, Cl. 382-9.000.
Pickett, Teddy L.; and Cook, Gary R., 4,567,100, Cl. 428-339.000.
U.S. Philips Corporation: *See*—
Assink, Gerardus J., 4,567,533, Cl. 358-342.000.
Bartels, Willem J., 4,567,605, Cl. 378-85.000.
Benschop, Nico F., 4,567,386, Cl. 307-481.000.
Driessen, Leonardus M. H. E., 4,567,518, Cl. 358-133.000.
Goossens, Urbanus P. M.; and Fierens, Gustaaf E. M., 4,567,327, Cl. 179-115.50R.
Groen, Robertus W. C.; de Jonge, Cornelis A. M.; Schwartz, Lawrence M.; and van Lier, Johannes C., 4,567,534, Cl. 358-342.000.
Heijnemans, Werner A. L., 4,566,756, Cl. 350-126.000.
Hulyer, Michael G., 4,567,508, Cl. 358-11.000.
Mannschke, Lothar, 4,566,753, Cl. 350-96.160.
Medema, Pieter W.; and Benjamins, Elmo I., 4,566,374, Cl. 99-281.000.
Minicilli, Jean, 4,567,592, Cl. 371-20.000.
Moors, Petrus M. A. W.; and Uittenbogaard, Teunis H., 4,566,176, Cl. 29-578.000.
Schilz, Wolfram; and Schiek, Burkhard, 4,567,484, Cl. 343-14.000.
Schofield, John, 4,567,453, Cl. 333-194.000.

Stroomer, Martinus V. C.; and Boekhorst, Frederick M., 4,567,522, Cl. 358-158.000.
van de Plassche, Rudy J.; and Sijbers, Peter J. M., 4,567,426, Cl. 323-315.000.
van de Polder, Leendert J., 4,567,520, Cl. 358-139.000.
van Gorkum, Aart A., 4,567,399, Cl. 313-449.000.
Wilhelm, Dieter; Schlagheck, Werner; and Toussaint, Rene , 4,567,397, Cl. 313-318.000.

United States Surgical Corporation: *See*—
Green, David T.; and Aranyi, Ernie, 4,566,620, Cl. 227-19.000.

United Technologies Corporation: *See*—
Brumen, Claudio, 4,566,857, Cl. 416-220.00R.
Comeau, Roger J.; and Baran, Walter J., Jr., 4,566,851, Cl. 415-139.000.
Gingras, Richard E., 4,566,269, Cl. 60-226.100.
Kesten, Arthur S., 4,567,033, Cl. 423-648.00R.
Miller, Gordon G., 4,566,856, Cl. 416-134.00A.
Shiembob, Lawrence T., 4,566,700, Cl. 277-53.000.
Trocciola, John C., 4,566,957, Cl. 204-73.00A.

Unitika Ltd.: *See*—
Matsumura, Wakuo; Kitazawa, Noboru; and Ohigashi, Yoshiaki, 4,566,250, Cl. 53-128.000.

Universite Rene Descartes Paris V: *See*—
Arhan, Pierre J.; and Hero, Marc R., 4,566,465, Cl. 128-778.000.

University of Dayton: *See*—
Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., 4,566,757, Cl. 350-162.120.

University of Minnesota, Regents of the: *See*—
Schwartz, Samuel, 4,567,148, Cl. 436-66.000.

University of Victoria: *See*—
O'Brien, Robert N.; McOrmond, Philip M.; Hocking, Martin B.; and Thornton, Kenneth R., 4,566,315, Cl. 73-61.400.

UOP Inc.: *See*—
Greenwood, Arthur R., 4,567,022, Cl. 422-144.000.
Greenwood, Arthur R.; Burgard, Jeffrey E.; and Throndson, Roger L., 4,567,023, Cl. 422-192.000.
Janikowski, Daniel S.; and Shum, Ming S., 4,567,111, Cl. 428-457.000.
Kulprathipanja, Santi, 4,567,309, Cl. 585-829.000.

Upjohn Company, The: *See*—
Ayer, Donald E., 4,567,000, Cl. 260-397.300.
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., 4,567,287, Cl. 560-024.000.
Goldwasser, David J.; and Oertel, Richard W., III, 4,567,236, Cl. 525-127.000.
Regelman, Dale F., 4,567,257, Cl. 544-78.000.
VanRheenen, Verlan H., 4,567,001, Cl. 260-397.300.

Uraca Pumpenfabrik GmbH & Co. KG: *See*—
Hanafi, Nabil, 4,566,370, Cl. 92-59.000.

Urdan Industries Ltd.: *See*—
Kataczynski, Nachman, 4,566,588, Cl. 206-3.000.

Uren, William J.: *See*—
Dolsen, Philip C.; Chandra, Satish; Hammon, Gordon R.; and Uren, William J., 4,567,482, Cl. 340-825.050.

Ushio Denki Kabushiki Kaisha: *See*—
Mimura, Yoshiki; Arai, Tetsuji; and Fukuda, Satoru, 4,567,352, Cl. 219-405.000.

Uskov, Alexandr I.: *See*—
Ljubman, Nazar Y.; Imangazieva, Gulsara K.; Nugmanova, Lyalya T.; Uskov, Alexandr I.; Sydykova, Tokhtobubu C.; and Kim, Zinaida I., 4,567,207, Cl. 521-35.000.

USM Corporation: *See*—
Sleger, Leon F.; and DiNozzi, Robert D., 4,566,594, Cl. 209-539.000.

Usuki, Kazuyasu: *See*—
Hirose, Noriyasu; Souda, Shigeru; Miyake, Kazutoshi; Kuriyama, Shizuo; Usuki, Kazuyasu; Akiyama, Yasuhiro; Nagaoka, Naoko; and Kawashima, Hidetoshi, 4,567,180, Cl. 514-253.000.

USV Pharmaceutical Corp.: *See*—
Chan, Wan-kit, 4,567,279, Cl. 548-491.000.
Musser, John H.; and Chakraborty, Utpal R., 4,567,184, Cl. 514-277.000.

Utagawa, Tadashi: *See*—
Nakagawa, Akio; Utagawa, Tadashi; and Tsukakoshi, Tsuneo, 4,567,502, Cl. 357-53.000.

Utsumi, Kazuaki: *See*—
Shimada, Yuzo; Utsumi, Kazuaki; Ikeda, Teruyuki; and Suzuki, Masanori, 4,567,542, Cl. 361-321.000.

Utumi, Masahiro: *See*—
Masuyama, Kenichi; Okutu, Toshimitu; Miyoshi, Takahito; Ogawa, Hiroshi; Utumi, Masahiro; Fujiyama, Masaaki; and Tada, Sugihiko, 4,567,057, Cl. 427-48.000.
Miyoshi, Takahito; Okutu, Toshimitu; Utumi, Masahiro; and Fujiyama, Masaaki, 4,567,063, Cl. 427-128.000.

Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, to Sintokogio Ltd. Moulding apparatus for making gas hardened sand mould. 4,566,521, Cl. 164-160.100.

Uzuhashi, Hideo: *See*—
Iizuka, Kenichi; Uzuhashi, Hideo; Uneyama, Yoshihisa; Matuda, Michiya; and Kobayashi, Minoru, 4,566,289, Cl. 62-228.400.

v Engelenburg, Hendrik; and Heemskerk, Rugerus S., to SKF Industrial Trading & Development Company B.V. Current collector for rotating shaft. 4,566,744, Cl. 339-8.00L.

V.I.K.-Consult ApS: *See*—
Korsgaard, Vagn, 4,567,080, Cl. 428-137.000.

Vaccaro, Charles A.: *See*—
Keenan, Charles E.; Mattern, Richard E.; and Vaccaro, Charles A., 4,566,400, Cl. 116-171.000.

Vaidyanathan, Swaminathan; and Adamson, Martyn G., to United States of America, Energy. Fuel pin cladding. 4,567,017, Cl. 376-417.000.

Valmet Oy: *See*—
Koponen, Martti; and Tapio, Olli, 4,566,946, Cl. 162-359.000.
Mauranen, Pekka; and Vedenpaa , Timo, 4,566,944, Cl. 162-286.000.

Van Cleave, Eugene H.; and Break, Douglas G., to Van Mark Products Corporation. Sheet metal bending brake. 4,566,304, Cl. 72-319.000.

Van Mark Products Corporation: *See*—
Van Cleave, Eugene H.; and Break, Douglas G., 4,566,304, Cl. 72-319.000.

van Asten, Christianus M. A. J. Sawing trestle. 4,566,559, Cl. 182-224.000.

van Belzen, David; Lotterbach, Gerhard; van Woudenberg, Jan F.; and Zucker, Udo, to Robert Bosch GmbH. Apparatus and method for monitoring a pressure sensor. 4,566,309, Cl. 73-4.00R.

van Buytene, Arie J., to Esmil Hubert B.V. Apparatus for storing and ventilating cheeses. 4,566,377, Cl. 99-474.000.

Vance, Gilbert W.: *See*—
Menzel, Stanley W. O.; Mominee, David E.; and Vance, Gilbert W., 4,566,496, Cl. 138-154.000.

Van Denberg, Ervin K., to Turner Quick Lift Corporation. Spaced axle-to-beam connection for suspension of the rigid beam type. 4,566,719, Cl. 280-711.000.

Vandeplas, Paul; and Kinnaer, Lucien, to Studiecentrum voor Kernenergie, "S.C.K." . Sun heating equipment. 4,566,430, Cl. 126-433.000.

van de Plassche, Rudy J.; and Sijbers, Peter J. M., to U.S. Philips Corporation. Current stabilizer with starting circuit. 4,567,426, Cl. 323-315.000.

van de Polder, Leendert J., to U.S. Philips Corporation. Television circuit arrangement for determining in a video signal frame periods comprising two field periods. 4,567,520, Cl. 358-139.000.

Van der Loon, Dwain; and Curths, Gary, to Alofs Manufacturing Company. Chatterless shifter. 4,566,349, Cl. 74-475.000.

van der Meer, Roelof: *See*—
Liu, Nan-I; and van der Meer, Roelof, 4,566,990, Cl. 252-503.000.

van der Schoot, Peter W. C., to Goudsche Machinefabriek B.V. Cover construction for a steam peeling apparatus. 4,566,375, Cl. 99-348.000.

van de Ven, Everhardus P. G. T.; and Towner, Janet M., to Signetics Corporation. Formation of electromigration resistant aluminum alloy conductors. 4,566,177, Cl. 29-590.000.

van Dongeren, Jan P., to Wavin B. V. Sealing body for a pipe connection. 4,566,704, Cl. 277-207.00A.

Van Dort, Mark A.: *See*—
Gatlin, Janice E.; Van Dort, Mark A.; Wilson, Charles A.; and Fung, Alexander P., 4,567,274, Cl. 546-345.000.

Van Gilder, Ron L.; and Lee, Do I., to Dow Chemical Company, The. High solids latexes for paper coatings. 4,567,099, Cl. 428-327.000.

van Gorkum, Aart A., to U.S. Philips Corporation. Cathode ray tube with spherical aberration correction means. 4,567,399, Cl. 313-449.000.

van Halteren, Aart Z., to Microtel B.V. Electret transducer and a method for manufacturing an assembly of backplate, electret foil and diaphragm plate. 4,567,382, Cl. 307-400.000.

VanHorne, Arthur C., to Tektronix, Inc. Separator sheets for collation with a stack of transparencies. 4,567,081, Cl. 428-138.000.

van Lier, Johannes C.: *See*—
Groen, Robertus W. C.; de Jonge, Cornelis A. M.; Schwartz, Lawrence M.; and van Lier, Johannes C., 4,567,534, Cl. 358-342.000.

VanRheenen, Verlan H., to Upjohn Company, The. 16-Methylene-17α-hydroxy-progesterones. 4,567,001, Cl. 260-397.300.

Van Roy, Georges: *See*—
Libouton, Jean-Claude; Waterlot, Lucien; and Van Roy, Georges, 4,566,920, Cl. 149-21.000.

Vansteelant, Marc G.: *See*—
Decoene, Frans J. G. C.; and Vansteelant, Marc G., 4,566,379, Cl. 100-89.000.

Van Tran, Hiep, to Mostek Corporation. CMOS Differential amplifier. 4,567,389, Cl. 307-530.000.

van Woudenberg, Jan F.: *See*—
van Belzen, David; Lotterbach, Gerhard; van Woudenberg, Jan F.; and Zucker, Udo, 4,566,309, Cl. 73-4.00R.

Varco, Joseph J.; and Williams, Carl E., to Clairol Incorporated. Stabilized hair spray composition and process. 4,567,040, Cl. 424-70.000.

Varian Associates, Inc.: *See*—
Landfors, Arthur A., 4,566,861, Cl. 417-54.000.
Wells, Gregory J.; and Simon, Richard K., 4,567,368, Cl. 250-379.000.

Varshney, Ramesh C., to Fairchild Camera & Instrument Corporation. Redundancy roll call technique. 4,567,580, Cl. 365-200.000.

Vasilieva, Olga V.: *See*—
Vinogradov, Georgy V.; Deinega, Jury F.; Yanovsky, Jury G.; Vasilieva, Olga V.; Konstantinov, Alexandr A.; and Chernysh, Mikhail M., 4,566,324, Cl. 73-60.000.

Vasipari Kutato es Fejleszto Vallalat: *See*—
Kovacs, Sandor, 4,566,341, Cl. 73-862.650.

Vaubel, Gert, to Benteler-Werke AG Werk Neuhaus. Adjustable sliding mold for multiple-strand casting devices. 4,566,523, Cl. 164-420.000.

VDO Adolf Schindling AG: *See*—
Lindig, Christian, 4,567,434, Cl. 324-160.000.

Rau, Karl; Kalk, Heinz; and Metzger, Gerhard, 4,566,322, Cl. 73-295.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Bottcher, Rolf; and Lindner, Hans-Jurgen, 4,566,681, Cl. 270-58.000.
Tappert, Hans-Jurgen; Naumann, Johannes; Forster, Karl-Heinz; Doliner, Herbert; Pieper, Fritz; Frenzel, Werner; and Schanze, Klaus, 4,566,385, Cl. 101-183.000.

Vedenpaa , Timo: *See*—
Mauranen, Pekka; and Vedenpaa , Timo, 4,566,944, Cl. 162-286.000.

Velic, Milan: *See*—
Lehner, August; Velic, Milan; Kopke, Helmut; Balz, Werner; Lenz, Werner; Baur, Reinhold; and Melzer, Milena, 4,567,109, Cl. 428-425.900.

Vensko, George; Carlin, Lawrence; Potter, John; and Smith, Allen R., to International Telephone and Telegraph Corporation. Data processing apparatus and method for use in speech recognition. 4,567,606, Cl. 381-43.000.

Venture Technology Limited: *See*—
Gilmour, Alexander, 4,567,121, Cl. 429-181.000.

Vepa Aktiengesellschaft: *See*—
Fleissner, Gerold, 4,566,378, Cl. 100-26.000.

Vernay Laboratories, Inc.: *See*—
Edwards, Floyd V.; and Boehmer, Dennis A., 4,566,493, Cl. 137-846.000.

Vernet, Pierre: *See*—
Diaz, Henri; Jorgensen, Pierre; and Vernet, Pierre, 4,566,961, Cl. 204-168.000.

Vesely, Gottfried, to Maier & Co. Set of parts for building small machine tools. 4,566,169, Cl. 29-560.000.

Via, Giorgio G.: *See*—
Fredericks, Edward C.; Greenhaus, Herbert L.; Nanda, Madan M.; and Via, Giorgio G., 4,567,132, Cl. 430-312.000.

Vibrachoc: *See*—
Le Pierres, Gildas, 4,566,677, Cl. 267-140.100.

Vicic, John C.: *See*—
Oberster, Arthur E.; and Vicic, John C., 4,567,211, Cl. 521-98.000.

Vickers, Kenny B. Western game of skill and risk. 4,566,697, Cl. 273-241.000.

Vickers Plc: *See*—
Watkiss, Philip J., 4,567,131, Cl. 430-309.000.

Victor Company of Japan, Ltd.: *See*—
Kinjo, Hisao, 4,567,535, Cl. 360-87.000.
Tsuchiya, Eiichi, 4,567,536, Cl. 360-94.000.

Victory Lane Ltd.: *See*—
DeSantis, Richard W., 4,567,044, Cl. 424-94.000.

Videojet Systems International, Inc.: *See*—
Bhatia, Yog R.; and Stallworth, Herman, 4,567,213, Cl. 523-160.000.

Villa, Ferruccio; and Castelli, Fabio, to FMC Corporation. Telecontrol system for cranes. 4,566,599, Cl. 212-160.000.

Vining, George E.: *See*—
Raymond, Theodore E.; Huggins, Thomas B.; and Vining, George E., 4,566,835, Cl. 414-53.000.

Vinogradov, Georgy V.; Deinega, Jury F.; Yanovsky, Jury G.; Vasilieva, Olga V.; Konstantinov, Alexandr A.; and Chernysh, Mikhail M. Method and device for determination of rheological characteristics of polymer and disperse systems. 4,566,324, Cl. 73-60.000.

Vitale, Ralph A. Tape square. 4,566,198, Cl. 33-138.000.

Voelker, Ferdinand: *See*—
Goldberg, David A.; Flood, William S.; Arthur, Allan A.; and Voelker, Ferdinand, 4,567,452, Cl. 332-7.000.

Voelskow, Hartmut; and Schlingmann, Merten, to Hoechst Aktiengesellschaft. Microbial polysaccharides, process for their preparation, microorganisms suitable for this and use of the polysaccharides. 4,567,140, Cl. 435-42.000.

Voest-Alpine Aktiengesellschaft: *See*—
Sulzbacher, Horst, 4,566,902, Cl. 75-26.000.

Vogelpohl, David R.: *See*—
Embree, David M.; Goldthorp, David C.; Longenecker, Howard H.; and Vogelpohl, David R., 4,567,333, Cl. 179-84.00T.

von Bogdandy, Ludwig; and Brotzmann, Karl, to Klockner CRA Technologie GmbH. Process for the production of iron. 4,566,904, Cl. 75-38.000.

von Kreuter, Alan, to Popsicle Industries, Inc. Apparatus for dispensing flowable material. 4,566,612, Cl. 222-309.000.

Vorbrueggen, Helmut: *See*—
Schwarz, Norbert; Skuballa, Werner; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,567,195, Cl. 514-419.000.

Vuillet, Jean-Pierre, to Societe Alsacienne de Construction de Material Textile. Device for temporarily uncoupling two coaxial rotating elements. 4,566,566, Cl. 192-24.000.

Vyas, Dolatrai M.; Kaneko, Takushi; and Doyle, Terrence W., to Bristol-Myers Company. Amidine process. 4,567,256, Cl. 544-58.200.

W. R. Grace & Co.: *See*—
Cogliano, Joseph A., 4,567,095, Cl. 428-314.400.
Hansson, Per E. A.; and Jachimowicz, Felek, 4,566,943, Cl. 162-168.200.
Okamoto, Yoshiyuki; and Hwang, Edward F., 4,567,298, Cl. 564-215.000.

W. S. Shamban & Company: *See*—
Traub, Henry A., 4,566,702, Cl. 277-121.000.

W. Schlafhorst & Co.: *See*—
Irmen, Wolfgang, 4,566,260, Cl. 57-22.000.
Kupper, Wilhelm, 4,566,651, Cl. 242-150.00R.

WABCO Westinghouse Steuerungstechnik GmbH & Co.: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,566,196, Cl. 33-125.00R.

Wachtel, Jean-Louis, to Celluloid S.A. Hairbrush. 4,566,145, Cl. 15-201.000.

Wacker-Chemie GmbH: *See*—
Ball, Peter; Marquardt, Klaus; Selig, Manfred; and Staudinger, Gunther, 4,567,297, Cl. 564-208.000.

Wacyk, Ihor T., to RCA Corporation. Linear sense amplifier. 4,567,387, Cl. 307-530.000.

Wag-Mor Corporation: *See*—
Morgan, William C.; and Wagner, Richard A., Sr., 4,567,514, Cl. 358-100.000.

Wagner, Richard A., Sr.: *See*—
Morgan, William C.; and Wagner, Richard A., Sr., 4,567,514, Cl. 358-100.000.

Wakao, Teruyoshi: *See*—
Masaki, Syouichi; Tamura, Kimio; Wakao, Teruyoshi; Nakashima, Noriyuki; Asami, Ken; and Sakai, Kazunori, 4,566,737, Cl. 303-109.000.

Walczak, Andrzej, to Map Mikrofilm Apparatebau Dr. Poehler GmbH & Co. KG. Cross-slide guide for a microfilm reader. 4,566,739, Cl. 308-3.00R.

Waldhecker, Heinz-Dieter: *See*—
Hoffmann, Harald; Henrich, Gunter; and Waldhecker, Heinz-Dieter, 4,566,882, Cl. 55-100.000.

Waldmann, Bernd: *See*—
Hildebrand, Reinhard; and Waldmann, Bernd, 4,566,399, Cl. 116-28.00R.

Waldmann, John J. Flocculating agents and processes for making them. 4,566,986, Cl. 252-175.000.

Walinsky, Stanley W.: *See*—
Stong, Randel E.; and Walinsky, Stanley W., 4,566,978, Cl. 252-8.50C.

Walker, Robert G.: *See*—
Witwer, Keith A.; and Walker, Robert G., 4,566,180, Cl. 29-596.000.

Wall, William A.: *See*—
Smith, Hubert E.; Wall, William A.; and Burns, Morrison R., Jr., 4,567,348, Cl. 219-124.340.

Wallace, Robert M.: *See*—
Buol, Douglas A.; Mize, Dean N.; Pattschull, John W.; and Wallace, Robert M., 4,567,432, Cl. 324-158.00F.

Wallace, William E.; and Yu, Gui Y., to Koppers Company, Inc. Zirconium-manganese-iron alloys. 4,567,032, Cl. 423-644.000.

Walter, Hartmut: *See*—
Maier, Peter; Attinger, Karl; Sigel, Albert; Hansel, Gernot; Kutscher, Erwin; and Walter, Hartmut, 4,566,830, Cl. 409-182.000.

Walter, Herman D.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Klopp, Gregory S.; Long, Alden O., Jr.; Moyer, Carl L.; Over, William R.; and Walter, Herman D., 4,566,164, Cl. 29-33.00M.

Walters, William R.: *See*—
Silverman, Daniel, 4,566,484, Cl. 137-403.000.

Walton, Emory R., Jr.: *See*—
Higgins, J. Aiden; and Walton, Emory R., Jr., 4,566,184, Cl. 29-840.000.

Waniisi, Tetuya; Sato, Hiroshi; and Nanba, Isao, to Omron Tateisi Electronics Co. Power source off delay timer with liquid crystal display. 4,566,803, Cl. 368-66.000.

Ward, Wallace E.: *See*—
Bateman, Charles D.; Grove, Michael M.; Noland, Lyle J.; and Ward, Wallace E., 4,567,483, Cl. 340-970.000.

Warman International Limited: *See*—
Grzina, Anthony, 4,566,850, Cl. 415-128.000.

Warren, Sanford E. Poultry defeathering apparatus and process. 4,566,151, Cl. 17-47.000.

Watanabe, Akio: *See*—
Arioka, Hiroyuki; Nishimatsu, Masaharu; and Watanabe, Akio, 4,567,083, Cl. 428-141.000.

Watanabe, Eiki, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for elevator. 4,567,419, Cl. 318-798.000.

Watanabe, Hideyuki; and Ichikawa, Yoshimitu, to Taiyo Shokai Co., Ltd. Method for automatic packing of articles capable of providing plastics packing bag with reinforced handle portion. 4,566,252, Cl. 53-410.000.

Watanabe, Hiroyuki: *See*—
Matsui, Kiyohide; Kikuchi, Yoshiyuki; Hiyama, Tamejiro; Tobita, Etsuko; Kondo, Kiyoshi; Akimoto, Akira; Seita, Toru; and Watanabe, Hiroyuki, 4,567,206, Cl. 521-27.000.

Watanabe, Kenji: *See*—
Sasaki, Masahiko; Watanabe, Kenji; and Kitamura, Seiichi, 4,566,398, Cl. 114-293.000.

Watanabe, Tohru: *See*—
Yoshida, Yukimasa; and Watanabe, Tohru, 4,566,941, Cl. 156-643.000.

Watanabe, Toshiyuki: *See*—
Arakawa, Jun; and Watanabe, Toshiyuki, 4,567,135, Cl. 430-505.000.

Waterlot, Lucien: *See*—
Libouton, Jean-Claude; Waterlot, Lucien; and Van Roy, Georges, 4,566,920, Cl. 149-21.000.

Watkins, Richard K.: *See*—
Wood, Prentice J.; Oliff, James R.; and Watkins, Richard K., 4,566,626, Cl. 229-37.00R.

Watkiss, Philip J., to Vickers Plc. Lithographic printing plates. 4,567,131, Cl. 430-309.000.

Watson, Alan R.; and Overley, John P., to Electro-Voice, Incorporated. Microphone for use on location. 4,567,608, Cl. 381-122.000.

Waugh, Robert E., to D. L. Auld Company, The. Process for making a trim strip for automobile bodies. 4,566,929, Cl. 156-242.000.

Wavin B. V.: *See*—
van Dongeren, Jan P., 4,566,704, Cl. 277-207.00A.

Waxman, Burton H.; and Lin, I. Sioun, to GAF Corporation. Low molecular weight hair spray. 4,567,035, Cl. 424-47.000.

Wayland Research Inc.: *See*—
McConnell, Robert K., 4,567,610, Cl. 382-18.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Knabe, Martin; and Anzenhofer, Wolfgang, 4,566,730, Cl. 296-221.000.

Webb, Wells A. System for producing crisp fruit chips. 4,566,376, Cl. 99-468.000.

Weber, Kurt: *See*—
Helmle, Theodor; and Weber, Kurt, 4,566,528, Cl. 165-26.000.

Weber, Michael: *See*—
Folger, Josef; Fournell, Hans-Dieter; Hein, Hans-Rudolf; Kapfhammer, Karl; Rambock, Josef; and Weber, Michael, 4,567,459, Cl. 340-58.000.

Weber, Milton N. Shoe heel spring support. 4,566,206, Cl. 36-7.800.

Weber, William E., to Radiation Equipment Company, Inc. Panoramic view bore examining apparatus. 4,566,789, Cl. 356-241.000.

Wedertz, Larry D.: *See*—
Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., 4,566,656, Cl. 244-3.110.

Wei, Peter H. L.; and Gregory, Francis J., to American Home Products Corporation. α-Phenyl-2-(aza)benzothiazolylthioglycolic acids and derivatives thereof. 4,567,267, Cl. 546-114.000.

Weigle, Dieter: *See*—
Heiser, Joachim; and Weigle, Dieter, 4,566,274, Cl. 60-444.000.

Weinberg, Ekkehard; and Hameister, Rolf, to Rehau Plastiks AG & Co. Blow-molded plastic body. 4,567,068, Cl. 428-31.000.

Weinberg, Marc S. Thorax protector. 4,566,458, Cl. 128-478.000.

Weinberg, Zeev A.: *See*—
Brodsky, Marc H.; and Weinberg, Zeev A., 4,566,913, Cl. 148-1.500.

Weller Innovation AB: *See*—
Sundberg, Erik, 4,566,513, Cl. 144-208.00E.

Wells, Gregory J.; and Simon, Richard K., to Varian Associates, Inc. Bipolar pulsed electron capture detectors. 4,567,368, Cl. 250-379.000.

Wells, Peter M., Jr.: *See*—
Zeller, John C.; and Wells, Peter M., Jr., 4,567,546, Cl. 361-420.000.

Wendel, Armin: *See*—
Posanski, Ulrich; Ghyczy, Miklos; Bauer, Kurt-Heinz; and Wendel, Armin, 4,567,161, Cl. 514-23.000.

Wenmec AB: *See*—
Norberg, Gustav S. I.; Segerstrom, Kjell E. L.; and Ahl, Tommy E., 4,566,951, Cl. 204-12.000.

Werley, Barry L., to Air Products and Chemicals, Inc. Method and apparatus to upgrade the capacity of ambient-air liquid cryogen vaporizers. 4,566,284, Cl. 62-52.000.

Wermelinger, Maurizio: *See*—
Sommer, Hans-Jorg; Lamparter, Hansruedi; and Wermelinger, Maurizio, 4,566,642, Cl. 242-18.00R.

Wessel Company, The: *See*—
Goldman, Michael B.; and Price, Frederick, 4,566,720, Cl. 281-15.00R.

Westberg, Erik: *See*—
Eriksson, Stig; Granberg, Bengt; and Westberg, Erik, 4,566,741, Cl. 312-194.000.

Western Ge..physical Company of America: *See*—
Landrum, Ralph A., Jr., 4,567,583, Cl. 367-190.000.

Westinghouse Electric Corp.: *See*—
Appleman, Robert H., 4,566,406, Cl. 122-405.000.
Peterson, Steven H.; and Phillips, D. Colin, 4,567,025, Cl. 204-157.200.
Polis, Marjorie J.; and Husson, Alan L., 4,567,560, Cl. 364-184.000.
Radford, Kenneth C.; and Carlson, William G., 4,566,989, Cl. 252-478.000.
Raymond, Theodore E.; Huggins, Thomas B.; and Vining, George E., 4,566,835, Cl. 414-53.000.

Westvaco Corporation: *See*—
Gendron, Wilfred H., 4,566,627, Cl. 229-81.000.

Wheeler, Stanley G., to Newall Engineering Company Limited, The. Workpiece guides. 4,566,228, Cl. 51-238.00S.

Whirlpool Corporation: *See*—
Mason, Anthony, 4,566,295, Cl. 68-12.00R.
Tershak, Andrew T.; and Thieneman, Michael D., 4,566,285, Cl. 62-129.000.

Whiting, Roger: *See*—
Kluge, Arthur F.; Clark, Robin D.; Strosberg, Arthur M.; Pascal, Jean-Claude G.; and Whiting, Roger, 4,567,264, Cl. 544-400.000.

Whitman, Peter J.: *See*—
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., 4,567,287, Cl. 560-024.000.

Wiblin, Wayne T.; Melocik, Grant C.; Leskovec, Edward V.; and Pickering, William, to Towmotor Corporation. Angular rotary position encoder. 4,567,467, Cl. 340-347.00P.

Wicke, Brian G., to General Motors Corporation. Self-pressurized damper. 4,566,565, Cl. 188-322.210.

Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Laurent, Henry; Annen, Klaus; and Wiechert, Rudolf, 4,567,002, Cl. 260-397.400.

Wiegand, Herbert, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Injection device for a diesel engine. 4,566,634, Cl. 239-410.000.

Wierzbicki, Michel, to ADIR, s.a.r.l. Thieno [2,3-b] pyrrole compounds and their use in alleviating pain. 4,567,196, Cl. 514-422.000.

Wiggins Teape Group Limited, The: *See*—
Shanton, Kenneth J., 4,567,498, Cl. 346-216.000.

Wilcox, Thomas W. Suspended combined electric current collection and traction systems. 4,567,334, Cl. 191-21.000.

Wilhelm, Dieter; Schlagheck, Werner; and Toussaint, Rene , to U.S. Philips Corporation. Electric lamp having a light source aligned to a cap. 4,567,397, Cl. 313-318.000.

Wilke, Arthur: *See*—
Schlegel, Wolfgang; Wilke, Arthur; and Stein, Roland, 4,566,680, Cl. 269-74.000.

Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Substituted pyranone inhibitors of cholesterol synthesis. 4,567,289, Cl. 560-059.000.

Willi Studer AG: *See*—
Zwicky, Paul, 4,567,443, Cl. 330-149.000.

William Prym-Werke KG: *See*—
Altwicker, Gerd; and Eiringhaus, Wilhelm, 4,566,182, Cl. 29-715.000.

Williams, Carl E.: *See*—
Varco, Joseph J.; and Williams, Carl E., 4,567,040, Cl. 424-70.000.

Williams, Clarence Orville: *See*—
Justice, Steve, 4,566,220, Cl. 43-113.000.

Williams, Gilmer A.; and Burgess, Douglas. Reed control mechanism for terry loom. 4,566,498, Cl. 139-26.000.

Williams, Leonard E. Cooking grid. 4,566,429, Cl. 126-14.000.

Williams Patent Crusher and Pulverizer Company: *See*—
Williams, Robert M., 4,566,639, Cl. 241-52.000.

Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Center feed material grinding mill. 4,566,639, Cl. 241-52.000.

Wilman, Hugh; and Brotton, James. Document scanners. 4,567,528, Cl. 358-285.000.

Wilson, Basil L. R. Router attachment. 4,566,512, Cl. 144-134.00D.

Wilson, Charles A.: *See*—
Gatlin, Janice E.; Van Dort, Mark A.; Wilson, Charles A.; and Fung, Alexander P., 4,567,274, Cl. 546-345.000.

Wilson, Randall B.: *See*—
Nelson, Ronald J.; and Wilson, Randall B., 4,566,171, Cl. 29-569.00L.

Wilson, Stephen T.; and Flanigen, Edith M., to Union Carbide Corporation. Crystalline metal aluminophosphates. 4,567,029, Cl. 423-306.000.

Wilson, Teck A. Power saw pruning device. 4,566,188, Cl. 30-166.00A.

Winrow, Donald; and Copeland, Kenneth G., to Nei Canada Limited. Display device. 4,566,210, Cl. 40-449.000.

Wisniewski, Richard A.: *See*—
Morris, S. Brent; and Wisniewski, Richard A., 4,567,572, Cl. 364-900.000.

Witkin, Roy T.: *See*—
Simon, Gilbert I.; and Witkin, Roy T., 4,567,036, Cl. 424-51.000.

Witwer, Keith A.; and Walker, Robert G., to Industra Products, Inc. Method and apparatus for placing coils and intermediate insulators in cores. 4,566,180, Cl. 29-596.000.

Wm Regele AB: *See*—
Nordlund, Sven, 4,566,670, Cl. 251-58.000.

Wodeslavsky, Josef, to Autoloc Corporation. Anti-theft apparatus for motor vehicles. 4,566,556, Cl. 180-287.000.

Wolf, Franz J.; and Klaschka, Rudolf. Metal closing disk and a process. 4,566,604, Cl. 220-68.000.

Wolf, Michael: *See*—
Gruhler, Siegfried; and Wolf, Michael, 4,566,199, Cl. 33-143.00M.

Wolff, Robert. Auxiliary device for re-grinding of spiral drills. 4,566,227, Cl. 51-219.00R.

Wolin, Dale, to Temco Products Corporation. Freezer accidental defrost warning device. 4,567,474, Cl. 340-584.000.

Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., to Eastern Company, The. Method for assembly of anti-static switch lock. 4,566,167, Cl. 29-437.000.

Wolters, Erich: *See*—
Blank, Heinz U.; and Wolters, Erich, 4,567,004, Cl. 260-465.00R.

Woo, Edmund P., to Dow Chemical Company, The. Allylation of carbon acids. 4,567,005, Cl. 260-465.00D.

Wood, James R. Pattern bonding of webs by electron beam curing. 4,566,927, Cl. 156-203.000.

Wood, Prentice J.; Oliff, James R.; and Watkins, Richard K., to Mead Corporation, The. End loading can carton. 4,566,626, Cl. 229-37.00R.

Woodring, William J.: *See*—
Canfield, V. Robert; Woodring, William J.; and Kubiak, Mira C., 4,567,079, Cl. 428-131.000.

Woods, Karl E., I; and Scott, Evan, Jr. Flexible extension device for toggle switches. 4,567,337, Cl. 200-331.000.

Wool, Arthur L. Sweep-arm bender for forming orthodontic arches. 4,566,305, Cl. 72-321.000.

World Video Library, Inc.: *See*—
Abraham, Nicholas F., 4,567,512, Cl. 358-86.000.

Worldtronics International, Inc.: *See*—
Koehler, Gerald C., 4,566,802, Cl. 368-9.000.

Woste, Josef, to Anton Cramer GmbH & Co. KG. Method and apparatus for the marking of gas-permeable fabric of cloth webs and other material webs, especially for the automatic marking in a marking station. 4,567,064, Cl. 427-157.000.

Wozniak, Walter J.: *See*—
Kulesza, Ralph J.; Wozniak, Walter J.; Disko, Harry; and Meyer, Burton C., 4,566,195, Cl. 33-27.110.

Wright, David W.: *See*—
Baldry, Peter J.; Collins, John H.; Morantz, Daniel J.; Overton, Terence K. W.; and Wright, David W., 4,567,122, Cl. 430-4.000.

Wright, Donald C., Jr.: *See*—
Bronson, James C.; and Wright, Donald C., Jr., 4,566,382, Cl. 101-35.000.

Wright, Joseph H., to Polaroid Corporation. Photographic film assemblage. 4,566,771, Cl. 354-283.000.

Wright, Joseph H.: *See*—
Czumak, Frank M.; and Wright, Joseph H., 4,566,770, Cl. 354-276.000.
Sulesky, Donald J.; and Wright, Joseph H., 4,566,772, Cl. 354-303.000.

Wrobleski, David L.: *See*—
Leigh-Monstevens, Keith V.; and Wrobleski, David L., 4,566,578, Cl. 192-98.000.

Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, to Monsanto Company. Process for preparing phosphorus-vanadium mixed oxide oxidation catalysts. 4,567,158, Cl. 502-209.000.

Wu, Che-Kuang, to Canyon Materials Research & Engineering. High energy beam colored glasses exhibiting insensitivity to actinic radiation. 4,567,104, Cl. 428-410.000.

Wuerzer, Bruno: *See*—
Plath, Peter; Schirmer, Ulrich; Reissenweber, Gernot; Wuerzer, Bruno; and Retzlaff, Guenter, 4,566,900, Cl. 71-100.000.

Wund, Josef. Outdoor recreation area cover. 4,566,475, Cl. 135-99.000.

Wunderlich, Dieter: *See*—
Egerbacher, Werner; and Wunderlich, Dieter, 4,567,504, Cl. 357-79.000.

Wuth, Wolfgang: *See*—
Melcher, Gerhard; Megerle, Friedrich; and Wuth, Wolfgang, 4,566,903, Cl. 75-26.000.

Wyatt, Virgil D.; Kraft, Wayne R.; and Thoma, Nandor G., to International Business Machines Corp. Large scale integration data processor signal transfer mechanism. 4,567,561, Cl. 364-200.000.

Wyber, James P.: *See*—
Dennis, Alan J.; Harrison, George E.; and Wyber, James P., 4,567,306, Cl. 568-455.000.

X-Ten Corporation: *See*—
De Witt, Nick; and Greene, Lindsey C., 4,566,714, Cl. 280-404.000.

Xerox Corporation: *See*—
Britt, James E.; Laskowski, Kenneth W.; Sisson, Jeffrey L.; and Rinehart, Stephen A., 4,566,782, Cl. 355-14.0SH.
Henry, Arnold W.; and Moser, Rabin, 4,567,349, Cl. 219-216.000.
Moore, Kenneth P., 4,566,683, Cl. 271-98.000.

Yabe, Hideo; and Koike, Ichiro, to Jidosha Kiki Co., Ltd. Method and device for controlling power steering apparatus. 4,567,413, Cl. 318-489.000.

Yabe, Yuhiko: *See*—
Takemoto, Akinobu; Takeichi, Kenzo; Yabe, Yuhiko; and Yoshikawa, Yoshiaki, 4,567,418, Cl. 318-685.000.

Yagi, Masao: *See*—
Mabuchi, Kenichi; and Yagi, Masao, 4,566,442, Cl. 128-52.000.

Yamada Dobby Co., Ltd.: *See*—
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.

Yamada, Shigemichi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,566,348, Cl. 74-359.000.

Yamada, Shigeru, to Casio Computer Co., Ltd. Optical reading apparatus. 4,567,360, Cl. 235-455.000.

Yamada, Takeo; Yamamoto, Tomohisa; Ando, Seigo; and Kawase, Yoshihiro, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for continuously measuring distance utilizing eddy current and having temperature difference influence elimination. 4,567,435, Cl. 324-207.000.

Yamaguchi, Hiroshi: *See*—
Miyauchi, Tateoki; Hongo, Mikio; Mizukoshi, Katsuro; Yamaguchi, Hiroshi; and Shimase, Akira, 4,566,765, Cl. 350-619.000.

Yamaguchi, Hisashi: *See*—
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, 4,567,470, Cl. 340-365.00C.

Yamaguchi, Kazufumi; and Murata, Takahiko, to Matsushita Electric Industrial Co., Ltd. Image sensor. 4,567,529, Cl. 358-294.000.

Yamaguchi, Kazuki: *See*—
Tomono, Hiromi; Kokubo, Takashi; Yamaguchi, Kazuki; and Ikuma, Sadao, 4,567,233, Cl. 525-71.000.

Yamaguchi, Tatuya, to Olympus Optical Co., Ltd. Endoscope. 4,566,437, Cl. 128-4.000.

Yamahata, Takashi: *See*—
Ohtsu, Tadatoshi; and Yamahata, Takashi, 4,567,113, Cl. 428-480.000.

Yamaji, Hiroshi: *See*—
Kano, Masaaki; Yamaji, Hiroshi; Nakao, Shinji; and Okumura, Katsuya, 4,567,364, Cl. 250-307.000.

Yamaji, Nobuyuki: *See*—
Kataoka, Shigehiro; Nakamura, Takashi; Yamaji, Nobuyuki; and Nasuno, Seiichi, 4,567,254, Cl. 536-27.000.

Yamamoku, Takeo: *See*—
Kitagawa, Hiroshi; Sato, Masaaki; Sawai, Mitsumasa; Yamamoku, Takeo; Akatsuka, Koichi; and Metoki, Toshio, 4,566,499, Cl. 139-59.000.

Yamamoto, Akira: *See*—
Takamizawa, Minoru; Yamamoto, Akira; and Nagura, Shigehiro, 4,567,245, Cl. 526-279.000.

Yamamoto, Hisashi: *See*—
Tomita, Yogi; Yamamoto, Hisashi; and Kitagawa, Susumu, 4,566,911, Cl. 134-6.000.

Yamamoto, Minato; and Takahashi, Shunji, to Mikuni Kogyo Kabushiki Kaisha. Electronically controlled internal combustion engine provided with an accelerator position sensor. 4,566,418, Cl. 123-479.000.

Yamamoto, Saburo: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,567,060, Cl. 427-87.000.

Yamamoto, Takao: *See*—
Sato, Yasuji; Yamamoto, Takao; Sano, Yoshikazu; and Nakayama, Yasunobu, 4,567,326, Cl. 179-90.00B.

Yamamoto, Tomohisa: *See*—
Yamada, Takeo; Yamamoto, Tomohisa; Ando, Seigo; and Kawase, Yoshihiro, 4,567,435, Cl. 324-207.000.

Yamamoto, Yosizi; and Ishikawa, Toshio, to Nippondenso Co., Ltd. Electric fan device for automotive vehicle. 4,566,864, Cl. 417-353.000.

Yamamuro, Sigeaki: *See*—
Kumura, Haruyoshi; Abo, Keiju; Tanaka, Yoshikazu; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,566,354, Cl. 74-866.000.

Yamaoka, Nobutatsu; and Sasazawa, Kazuo, to Taiyo Yuden Co., Ltd. Electronconductive paste to be baked on ceramic bodies to provide capacitors, varistors or the like. 4,567,059, Cl. 427-79.000.

Yamashita, Shigeru: *See*—
Matsumoto, Mitsuo; Miura, Shinichi; Kikuchi, Koichi; Tamura, Masuhiko; Kojima, Hidetaka; Koga, Kunio; and Yamashita, Shigeru, 4,567,305, Cl. 568-454.000.

Yamashita, Yoshihiro: *See*—
Ohmura, Kenji; Miyata, Tsutomu; Yamashita, Yoshihiro; and Noda, Minoru, 4,566,841, Cl. 414-417.000.

Yamato Scale Company, Limited: *See*—
Oshima, Yasushi, 4,566,549, Cl. 177-245.000.

Yamauchi, Takashi: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Yamauchi, Takashi; and Iizuka, Akira, 4,567,293, Cl. 562-496.000.

Yamazaki, Chikayasu; Torikai, Jun; and Kumo, Ichiro, to Toray Industries, Inc. Process and apparatus for measuring thermal shrinkage properties of yarn. 4,566,319, Cl. 73-160.000.

Yamazaki, Hisashi: *See*—
Ishizuka, Akio; Yamazaki, Hisashi; and Yamazaki, Kikuo, 4,567,371, Cl. 250-483.100.

Yamazaki, Kikuo: *See*—
Ishizuka, Akio; Yamazaki, Hisashi; and Yamazaki, Kikuo, 4,567,371, Cl. 250-483.100.

Yamazaki, Yoshio; Takimoto, Masahiro; and Ohta, Satoshi, to Toyoda Gosei Co. Ltd. Steering wheel made of soft resin. 4,567,217, Cl. 524-296.000.

Yanagisawa, Hiroshi, to Tachikawa Spring Co., Ltd. Seat suspension. 4,566,667, Cl. 248-561.000.

Yanai, Keisuke: *See*—
Yoshida, Zenichi; Kato, Susumu; Amemiya, Yasuhiro; and Yanai, Keisuke, 4,567,308, Cl. 585-375.000.

Yanovsky, Jury G.: *See*—
Vinogradov, Georgy V.; Deinega, Jury F.; Yanovsky, Jury G.; Vasilieva, Olga V.; Konstantinov, Alexandr A.; and Chernysh, Mikhail M., 4,566,324, Cl. 73-60.000.

Yant, Kenneth B., to Dana Corporation. Strut synchronizer for transmissions. 4,566,568, Cl. 192-53.00F.

Yarkosky, Eugene F.: *See*—
Schultz, Paul B.; and Yarkosky, Eugene F., 4,567,066, Cl. 427-305.000.

Yashiro, Yoshinobu; and Ito, Takeshi. Two-cycle engine. 4,566,409, Cl. 123-65.0PE.

Yasuda, Seiji; Koshino, Yutaka; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device and method for manufacturing the same. 4,566,174, Cl. 29-576.00W.

Yasuda, Yasushi; Enomoto, Hiromu; Shimauchi, Yoshiki; and Tahara, Akinori, to Fujitsu Limited. Schmitt trigger circuit. 4,567,380, Cl. 307-290.000.

Yasutomi, Kazuki: *See*—
Kurosawa, Toshishige; Ishisaka, Satoru; Yasutomi, Kazuki; and Ishiwatari, Takanobu, 4,566,218, Cl. 43-58.000.

Yazaki, Takao; Hattori, Kazuhide; Matsuno, Takumi; Hayama, Kazuhide; Ito, Isao; and Saito, Yukio, to Mitsubishi Petrochemical Co., Ltd.; and Mitsubishi Yuka Fine Chemical Co. Composite heat-insulating material. 4,567,097, Cl. 428-317.700.

Yazaki, Takao: *See*—
Hattori, Satoru; Yazaki, Takao; Hattori, Kazuhide; Nishida, Koji; Hattori, Hideki; and Fujimura, Kazumasa, 4,567,089, Cl. 428-213.000.

Yegenoglu, Kemal: *See*—
Schleich, Heinrich; and Yegenoglu, Kemal, 4,566,426, Cl. 125-11.00R.

Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,566,948, Cl. 203-51.000.
Yoda, Kenichi: *See*—
Onogi, Toshiro; Yoda, Kenichi; and Kitamura, Masahiko, 4,567,556, Cl. 364-140.000.
Yokohama Rubber Co., Ltd., The: *See*—
Misawa, Makoto; Mizoguchi, Tetsuya; Kawakami, Kinya; and Ahagon, Asahiro, 4,567,225, Cl. 524-526.000.
Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Image reading apparatus. 4,567,527, Cl. 358-282.000.
Yokoyama, Hideki: *See*—
Tanishi, Tokio; and Yokoyama, Hideki, 4,566,748, Cl. 339-95.00D.
Yoneda, Fumio, to Toyo Jozo Kabushiki Kaisha. Synthesis of 5-deazariboflavine. 4,567,260, Cl. 544-250.000.
Yonezawa, Toshio: *See*—
Yasuda, Seiji; Koshino, Yutaka; and Yonezawa, Toshio, 4,566,174, Cl. 29-576.00W.
Yong, Raymond N.; and Sethi, Amar J., to Suncor, Inc. Hydrolyzed yam starch flocculants. 4,566,909, Cl. 127-33.000.
Yoon, Hyun-Nam, to Celanese Corporation. Process for forming thermally stable thermotropic liquid crystalline polyesters of predetermined chain length utilizing aromatic hydroxyl monomer and/or aromatic amine monomer. 4,567,247, Cl. 528-190.000.
Yoshida Kogyo K.K.: *See*—
Sarasue, Hirotaka; and Tsubokawa, Yoshitoki, 4,566,156, Cl. 24-398.000.
Yoshida, Okio: *See*—
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,567,525, Cl. 358-213.000.
Yoshida, Ryuichi; Suzuki, Shigeru; Koishikawa, Hirotoshi; Miyamoto, Yoshimi; and Kawai, Kazuhide, to Tokai Electric Wire Company Limited. Distributor cap with ignition cable. 4,566,751, Cl. 339-218.00S.
Yoshida, Seiichiro: *See*—
Kamano, Yoshiaki; Sugai, Saburo; Okazaki, Tokuji; Yoshida, Seiichiro; and Akaboshi, Sanya, 4,567,172, Cl. 514-179.000.
Yoshida, Yukimasa; and Watanabe, Tohru, to Kabushiki Kaisha Toshiba. Reactive ion etching method. 4,566,941, Cl. 156-643.000.
Yoshida, Zenichi; Kato, Susumu; Amemiya, Yasuhiro; and Yanai, Keisuke, to Asahi Chemical Co., Ltd.; and Yoshida, Zenichi. Process for preparing alkylcyclopentadiene derivatives. 4,567,308, Cl. 585-375.000.
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, to Fujitsu Limited. Touch sensing device. 4,567,470, Cl. 340-365.00C.
Yoshikawa, Keiji: *See*—
Makino, Syozaburo; Yoshikawa, Keiji; and Nakasho, Tukayo, 4,566,163, Cl. 28-187.000.
Yoshikawa, Yoshiaki: *See*—
Takemoto, Akinobu; Takeichi, Kenzo; Yabe, Yuhiko; and Yoshikawa, Yoshiaki, 4,567,418, Cl. 318-685.000.
Yoshimine, Kazuya: *See*—
Miyazaki, Tsutomu; Fukuda, Tatemi; and Yoshimine, Kazuya, 4,566,263, Cl. 57-276.000.
Yoshimitsu, Yasuro: *See*—
Ohkubo, Masao; and Yoshimitsu, Yasuro, 4,567,433, Cl. 324-158.00P.
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, to Mitsui Toatsu Chemicals, Inc. Diphenyl ether derivatives and herbicides containing same. 4,566,897, Cl. 71-88.000.
Yoshinori Kidani: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,567,285, Cl. 556-137.000.
Yoshioka, Takatoshi; Kirihara, Seishin; Shiga, Masao; Iijima, Katsumi; Hisano, Katsukuni; and Kaneko, Ryoichi, to Hitachi, Ltd. Steam turbine rotor shaft. 4,566,810, Cl. 384-280.000.
Yoshizawa, Hanako: *See*—
Ooi, Kiyoshi; Morita, Michio; Suzuki, Kazuyoshi; Hashizume, Soh; and Yoshizawa, Hanako, 4,567,147, Cl. 435-237.000.
Young, Chung I.: *See*—
Isbrandt, Russell R.; and Young, Chung I., 4,567,133, Cl. 430-348.000.
Young, John N., to Charles C. Worth Corporation. Two-speed drive for a fishing reel. 4,566,655, Cl. 242-215.000.
Young, Steven D., to Merck & Co., Inc. Process for preparation of certain tetrahydrofuro[3,4-b]pyridines. 4,567,268, Cl. 546-116.000.
Young, William R: *See*—
Cohen, Paul; and Young, William R, 4,567,578, Cl. 365-189.000.
Yu, Gui Y.: *See*—
Wallace, William E.; and Yu, Gui Y., 4,567,032, Cl. 423-644.000.
Yuan, Herbert H.: *See*—
O'Meara, Joseph D., Jr.; Yuan, Herbert H.; Lease, William O.; and Stapleton, Robert G., 4,567,373, Cl. 250-573.000.
Yuasa, Kazuhiro; and Komada, Kenya, to Ricoh Company, Ltd. Record head cleaning device for image recording apparatus. 4,567,495, Cl. 346-153.100.
Yuasa, Shigeki; Okabayashi, Minahiro; Ohno, Hideki; Suzuki, Katsumi; and Kusumoto, Koshi, to Tokuyama Soda Kabushiki Kaisha. Amorphous, spherical inorganic compound and process for preparation thereof. 4,567,030, Cl. 423-326.000.
Yuda, Lawrence F. Robotic gripper. 4,566,727, Cl. 294-88.000.
Yugengaisha Kyodogiken: *See*—
Orii, Masaru, 4,566,306, Cl. 72-346.000.
Zacchio, Joseph M., to Transamerica Delaval Inc. Microwave tank-contents level measuring assembly with lens-obturated wall-opening. 4,566,321, Cl. 73-290.00R.
Zahn, Wolfgang: *See*—
Fursich, Manfred; Treiber, Helmut; Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,566,786, Cl. 355-77.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; and Kondo, Shinichi, 4,567,165, Cl. 514-36.000.
Zandel, Adam; and Zeitlin, Alexander, to A. Zeitlin & Associates. Pressure seal for ultra-high pressure apparatus. 4,566,372, Cl. 92-168.000.
Zanders Feinpaiere AG: *See*—
Becker, Franz-Josef; Hubner, Erich; and Lammerich, Walter, 4,567,098, Cl. 428-327.000.
Zbinden, Terry B., to Sperry Corporation. Detection of catastrophic failure of dielectric, improper connection, and temperature of a printed circuit assembly via one wire. 4,567,428, Cl. 324-73.0PC.
Zebisch, Manfred W., to International Standard Electric Corporation. Signal generator. 4,567,376, Cl. 307-106.000.
Zehetbauer, Rudolf: *See*—
Hollaus, Reinhard; Zehetbauer, Rudolf; and Bednorz, Klaus, 4,567,316, Cl. 136-246.000.
Zeitler, Peter: *See*—
Smuda, Siegfried; Horner, Peter; Kogel, Karl; and Zeitler, Peter, 4,566,673, Cl. 254-84.000.
Zeitlin, Alexander: *See*—
Zandel, Adam; and Zeitlin, Alexander, 4,566,372, Cl. 92-168.000.
Zeller, John C.; and Wells, Peter M., Jr., to All States Plastic Mfg. Co., Inc. Anchor base mounting block. 4,567,546, Cl. 361-420.000.
Zelt, Rainer: *See*—
Gey, Mathias; Grote, Jurgen; Pittel, Horst; Samol, Gerd W.; and Zelt, Rainer, 4,567,085, Cl. 428-163.000.
Zenith Electronics Corporation: *See*—
Srivastava, Gopal K.; and Lee, Ronald B., 4,567,447, Cl. 331-1.00A.
Zetterberg, Gunnar; and Angquist, Lennart, to ASEA Aktiebolag. Static convertor means. 4,567,554, Cl. 363-138.000.
Zielinski, Erich: *See*—
Bierwirth, Adolf P.; and Zielinski, Erich, 4,566,369, Cl. 89-45.000.
Zimmer, Inc.: *See*—
Lewis, Edward L.; Parr, Jack E.; Fox, Mark A.; and Fuson, Robert L., 4,566,138, Cl. 623-22.000.
Zimmer, William J.: *See*—
DiGiovanniantonio, Perry R.; and Zimmer, William J., 4,566,658, Cl. 244-110.00R.
Zimmerman, Garyx; and Dickenson, Donald E. Sweetener composition. 4,567,054, Cl. 426-548.000.
Zitting, Gordon T., to Microdot Incorporated. Seal assembly. 4,566,703, Cl. 277-165.000.
Zucker, Udo: *See*—
van Belzen, David; Lotterbach, Gerhard; van Woudenberg, Jan F.; and Zucker, Udo, 4,566,309, Cl. 73-4.00R.
Zuend, Marcel, to Rieter Machine Works. Method of removing flocks from fiber bales. 4,566,152, Cl. 19-81.000.
Zurheide, Manfred: *See*—
Gossler, Werner; Strube, Anneliese; and Zurheide, Manfred, 4,566,173, Cl. 29-571.000.
Zwick, Werner: *See*—
Dressel, Manfred; Eberle, Heinrich; Ripperger, Willi; Ruehenbeck, Wolfgang; and Zwick, Werner, 4,567,294, Cl. 562-555.000.
Zwicky, Paul, to Willi Studer AG. Low-distortion audio amplifier circuit arrangement. 4,567,443, Cl. 330-149.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JANUARY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bennett, Richard N., to National Instrument Company, Inc. High-speed filling machine. Re. 32,074, Cl. 141-169.000.

Brown, David A.: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., Re. 32,075, Cl. 360-77.000.

Chiddix, Max E., to GAF Corporation. Process of producing a distilled butanediol product of high quality in high yield. Re. 32,072, Cl. 568-861.000.

Daniels, Donald V.: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., Re. 32,075, Cl. 360-77.000.

GAF Corporation: *See*—
Chiddix, Max E., Re. 32,072, Cl. 568-861.000.

Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., to Quantum Corporation. Data transducer position control system for rotating disk data storage equipment. Re. 32,075, Cl. 360-77.000.

Minnesota Mining and Manufacturing Company: *See*—
Randklev, Ronald M., Re. 32,073, Cl. 523-117.000.

National Instrument Company, Inc.: *See*—
Bennett, Richard N., Re. 32,074, Cl. 141-169.000.

Quantum Corporation: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., Re. 32,075, Cl. 360-77.000.

Randklev, Ronald M., to Minnesota Mining and Manufacturing Company. Dental filling composition utilizing zinc-containing inorganic filler. Re. 32,073, Cl. 523-117.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Albrecht, Paul N.: *See*—
Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., B1 4,231,105, Cl. 364-900.000.

B. F. Goodrich Company, The: *See*—
Oetzel, John T., B1 4,251,648, Cl. 525-187.000.

Baker International Corporation: *See*—
McStravick, David M.; and Roberts, William M., B1 4,270,606, Cl. 166-181.000.

Berecz, Imre, to Kaynar Mfg. Co., Inc. Systematized apparatus for driving fasteners. B1 3,750,257, 1-28-86, Cl. 29-813.000.

Canizares, Hugo M.: *See*—
Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., B1 4,231,105, Cl. 364-900.000.

Kaynar Mfg. Co., Inc.: *See*—
Berecz, Imre, B1 3,750,257, Cl. 29-813.000.

McStravick, David M.; and Roberts, William M., to Baker International Corporation. Apparatus for selective disengagement of a fluid transmission conduit and for control of fluid transmission from a well zone. B1 4,270,606, 1-28-86, Cl. 166-181.000.

Oetzel, John T., to B. F. Goodrich Company, The. Peroxide cured epihalohydrin polymers. B1 4,251,648, 1-28-86, Cl. 525-187.000.

Roberts, William M.: *See*—
McStravick, David M.; and Roberts, William M., B1 4,270,606, Cl. 166-181.000.

Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., to UMC Industries, Inc. Vendor control circuit. B1 4,231,105, 1-28-86, Cl. 364-900.000.

UMC Industries, Inc.: *See*—
Schuller, James T.; Albrecht, Paul N.; and Canizares, Hugo M., B1 4,231,105, Cl. 364-900.000.

LIST OF DESIGN PATENTEES

Ace Termite & Pest Control: *See*—
Ford, Harold A.; and Young, Cecil G., 282,390, Cl. D22-18.000.

Aderman, Wayne L., to International Business Machines Corporation. Data processor. 282,366, 1-28-86, Cl. D14-102.000.

Allen, James H., to 'totes', incorporated. Expandable bag. 282,315, 1-28-86, Cl. D3-71.000.

Amco Corporation: *See*—
Ettlinger, Ralph, 282,394, Cl. D23-37.000.

American Commercial, Incorporated: *See*—
Blake, Alfred, 282,333, Cl. D7-18.000.
Laslo, Larry R., 282,332, Cl. D7-17.000.
McBride, James, 282,330, Cl. D7-9.000.

Anderson, Charles. Extendable tripod unit. 282,320, 1-28-86, Cl. D6-300.000.

Arai, Shu: *See*—
Takahashi, Hiroshi; Arai, Shu; Kishimoto, Yasuhiro; and Tomimatsu, Kiyoshi, 282,364, Cl. D14-64.000.

Argandona, Augusto, to Quaker Oats Company, The. Toy zoo. 282,385, 1-28-86, Cl. D21-115.000.

Aspen Laboratories, Inc.: *See*—
Shackelford, John T., 282,403, Cl. D24-54.000.

AT&T Information Systems Inc.: *See*—
Campbell, John S.; Engstrom, John G.; and McGarvey, John N., 282,358, Cl. D14-52.000.

Balance House, Ltd.: *See*—
Curran, William W., 282,377, Cl. D19-26.000.

Bean Station Furniture Factory, The: *See*—
Christa, Carol; and Waldron, Patrick, 282,321, Cl. D6-381.000.

Bell, Ted A., to Pretty Products, Inc. Merchandise display rack. 282,326, 1-28-86, Cl. D6-566.000.

Bender, Annie L.: *See*—
Bender, Robert L.; and Bender, Annie L., 282,382, Cl. D21-34.000.

Bender, Robert L.; and Bender, Annie L. Game board. 282,382, 1-28-86, Cl. D21-34.000.

Black & Decker Inc.: *See*—
Pioch, Peter-Paul, 282,346, Cl. D8-66.000.

Blaimschein, Josef, to Optyl Eyewear Fashion International Corporation. Sunglasses. 282,372, 1-28-86, Cl. D16-102.000.

Blake, Alfred, to American Commercial, Incorporated. Sugar bowl. 282,333, 1-28-86, Cl. D7-18.000.

Blue Feather Products, Inc.: *See*—
King, Feather W., 282,380, Cl. D19-75.000.

Brescia, Anthony J.; and Harris, Shurley, to Syroco, Inc. Wall mounted shelf unit. 282,328, 1-28-86, Cl. D6-570.000.

British Gas Corporation: *See*—
Thomas, Richard C.; and Daniels, David J., 282,350, Cl. D10-47.000.

Brown, Michael; Read, Clifford D.; and Ellis, Warren K., to Northern Telecom Limited. Telephone set base. 282,361, 1-28-86, Cl. D14-60.000.

Brown, Michael; Read, Clifford D.; and Ellis, Warren K., to Northern Telecom Limited. Housing for a telephone handset. 282,362, 1-28-86, Cl. D14-63.000.

Bruffey, Robert D., Jr.: *See*—
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, 282,342, Cl. D7-398.000.

Button Fronts (London) Limited: *See*—
Valori, Peter, 282,309, Cl. D2-273.000.
Valori, Peter, 282,310, Cl. D2-273.000.
Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 282,359, Cl. D14-53.000.
Cable Electronic Products, Inc.: *See*—
Schwartz, Frederic W., 282,356, Cl. D14-4.000.
Campbell, John S.; Engstrom, John G.; and McGarvey, John N., to AT&T Information Systems Inc. Telecommunications system console or similar article. 282,358, 1-28-86, Cl. D14-52.000.
Canon Kabushiki Kaisha: *See*—
Kikuchi, Nobuo; and Odagawa, Kazuyoshi, 282,376, Cl. D18-7.000.
Maekawa, Tomohiro; and Nibley, Richard, 282,374, Cl. D18-1.000.
Takahashi, Masaki; and Murakami, Osamu, 282,373, Cl. D18-1.000.
CBS Inc.: *See*—
Dyar, Jane C., 282,381, Cl. D21-20.000.
Chen, Ming-Ter. Plate or the like. 282,334, 1-28-86, Cl. D7-36.000.
Christa, Carol; and Waldron, Patrick, to Bean Station Furniture Factory, The. Seat. 282,321, 1-28-86, Cl. D6-381.000.
Coates, Eric: *See*—
Hoefer, Peter S.; and Coates, Eric, 282,352, Cl. D10-81.000.
Coca-Cola Company, The: *See*—
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, 282,342, Cl. D7-398.000.
Cojulun, Carlos: *See*—
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, 282,342, Cl. D7-398.000.
Collins, Harry F., to Service Ideas, Inc. Condiment holder and organizer. 282,336, 1-28-86, Cl. D7-58.000.
Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 282,383, Cl. D21-63.000.
Curran, William W., to Balance House, Ltd. Folder with clock and memo pad or the like. 282,377, 1-28-86, Cl. D19-26.000.
Daniels, David J.: *See*—
Thomas, Richard C.; and Daniels, David J., 282,350, Cl. D10-47.000.
Darr, Richard C.: *See*—
Larson, Craig A.; and Darr, Richard C., 282,349, Cl. D9-395.000.
Dart Industries Inc.: *See*—
Picozza, Augusto A., 282,337, Cl. D7-70.000.
Dealey, Michael J.; and Fowell, Ian G. G., to Sport Engineering Limited. Treadmill. 282,386, 1-28-86, Cl. D21-192.000.
de Villiers, Simon, to Omark Industries. Hole saw. 282,369, 1-28-86, Cl. D15-139.000.
Dick, H. Wayne, to PPG Industries, Inc. Yarn bobbin. 282,312, 1-28-86, Cl. D3-24.000.
Dodd, Malcolm J.; and Juhas, Joseph A., to PTC Aerospace Inc. Food service tray. 282,335, 1-28-86, Cl. D7-38.000.
Dolson, Richard G., to Veeder Industries Inc. Portable voting booth. 282,375, 1-28-86, Cl. D18-6.000.
Durand, Philippe J. Tumbler or similar article. 282,329, 1-28-86, Cl. D7-8.000.
Dvorak, Larry H. Meat grinding table. 282,341, 1-28-86, Cl. D7-372.000.
Dyar, Jane C., to CBS Inc. Game for a matching game. 282,381, 1-28-86, Cl. D21-20.000.
Ellis, Kenneth A. Bookstand. 282,324, 1-28-86, Cl. D6-475.000.
Ellis, Warren K.: *See*—
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., 282,361, Cl. D14-60.000.
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., 282,362, Cl. D14-63.000.
Engstrom, John G.: *See*—
Campbell, John S.; Engstrom, John G.; and McGarvey, John N., 282,358, Cl. D14-52.000.
Ettlinger, Ralph, to Amco Corporation. Spray head. 282,394, 1-28-86, Cl. D23-37.000.
F.Lli Guzzini S.p.A.: *See*—
Pozzi, Ambrogio, 282,331, Cl. D7-14.000.
FARMIGEA S.p.A.: *See*—
Federighi, Alberto, 282,348, Cl. D9-341.000.
Federighi, Alberto, to FARMIGEA S.p.A. Multi-unit package of containers for pharmaceutical products. 282,348, 1-28-86, Cl. D9-341.000.
Fehrs, Helimuth. Pneumatic fastener driving tool. 282,345, 1-28-86, Cl. D8-49.000.
Fetty, Lowell L. Pan lid holder. 282,323, 1-28-86, Cl. D6-462.000.
Ford, Harold A.; and Young, Cecil G., to Ace Termite & Pest Control. Rodent control device. 282,390, 1-28-86, Cl. D22-18.000.
Fowell, Ian G. G.: *See*—
Dealey, Michael J.; and Fowell, Ian G. G., 282,386, Cl. D21-192.000.
Gell, Peter L., to Plastex Technology (Curacao) N.V. Microfilm cartridge or similar article. 282,357, 1-28-86, Cl. D14-11.000.
Guy, Thomas D.; Rawson, Paul O.; and Yagami, Richard H., to United States Surgical Corporation. Surgical skin stapler. 282,400, 1-28-86, Cl. D24-26.000.
Hamilton Industries: *See*—
Yindra, Leonard J., 282,398, Cl. D24-7.000.
Harris, Shurley: *See*—
Brescia, Anthony J.; and Harris, Shurley, 282,328, Cl. D6-570.000.
Hartzell, James R. Wood plaque. 282,355, 1-28-86, Cl. D11-132.000.
Hasegawa, Masayuki: *See*—
Ohyabu, Toshiharu; and Hasegawa, Masayuki, 282,378, Cl. D19-43.000.
Hayashida, Nobuhiro, to Matsushita Graphic Communication Systems, Inc. Facsimile transceiver. 282,365, 1-28-86, Cl. D14-94.000.
Hengesbach, Robert W. Spray gun. 282,392, 1-28-86, Cl. D23-17.000.
Herzfeld, Ronald. Brush holder. 282,316, 1-28-86, Cl. D4-104.000.
Herzfeld, Ronald. Brush and holder. 282,317, 1-28-86, Cl. D4-104.000.
Herzfeld, Ronald. Brush. 282,318, 1-28-86, Cl. D4-104.000.
Herzfeld, Ronald. Brush assembly. 282,319, 1-28-86, Cl. D4-115.000.
Hill, Clarence E., to Sportsman's Enterprises. Signalling device for fishing. 282,389, 1-28-86, Cl. D22-13.000.
Hoefer, Peter S.; and Coates, Eric, to Hoefer Scientific Instruments. Horizontal gel slab electrophoresis unit. 282,352, 1-28-86, Cl. D10-81.000.
Hoefer Scientific Instruments: *See*—
Hoefer, Peter S.; and Coates, Eric, 282,352, Cl. D10-81.000.
Hoese, Fred O. Holder for cassette tapes. 282,314, 1-28-86, Cl. D3-35.000.
Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.): *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 282,395, Cl. D23-121.000.
Innovative Concepts, Inc.: *See*—
Long, Jerry M.; and Womack, James A., 282,313, Cl. D3-35.000.
International Business Machines Corporation: *See*—
Aderman, Wayne L., 282,366, Cl. D14-102.000.
Kapper, Henry; Kraus, Walter F.; and Wittkamp, Joel M., 282,363, Cl. D14-63.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 282,383, Cl. D21-63.000.
ITT Industries, Inc.: *See*—
Johansson, Gunnar, 282,371, Cl. D15-147.000.
Ogren, Lars, 282,370, Cl. D15-147.000.
Johansson, Gunnar, to ITT Industries, Inc. Combined submersible suspension mixer and rack. 282,371, 1-28-86, Cl. D15-147.000.
Johnson, Wendell D., to Qualitrol Corporation. Combined pressure relief valve and clamp. 282,393, 1-28-86, Cl. D23-20.000.
Juhas, Joseph A.: *See*—
Dodd, Malcolm J.; and Juhas, Joseph A., 282,335, Cl. D7-38.000.
Kain, John W. Combined eye shade and ear protector. 282,308, 1-28-86, Cl. D2-247.000.
Kapper, Henry; Kraus, Walter F.; and Wittkamp, Joel M., to International Business Machines Corporation. Telephone handset. 282,363, 1-28-86, Cl. D14-63.000.
Kassai Kabushiki Kaisha: *See*—
Kassai, Kenzou, 282,384, Cl. D21-78.000.
Kassai, Kenzou, to Kassai Kabushiki Kaisha. Riding toy. 282,384, 1-28-86, Cl. D21-78.000.
Kikuchi, Nobuo; and Odagawa, Kazuyoshi, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 282,376, 1-28-86, Cl. D18-7.000.
King, Feather W., to Blue Feather Products, Inc. Holder for retaining small metal objects magnetically. 282,380, 1-28-86, Cl. D19-75.000.
Kishimoto, Yasuhiro: *See*—
Takahashi, Hiroshi; Arai, Shu; Kishimoto, Yasuhiro; and Tomimatsu, Kiyoshi, 282,364, Cl. D14-64.000.
Kitada, Fumihiko: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 282,395, Cl. D23-121.000.
Knoll International, Inc.: *See*—
Meier, Richard, 282,325, Cl. D6-495.000.
Korthoff, Herbert W.; and Tompkins, Thomas, to United States Surgical Corporation. Disposable cartridge for a linear surgical stapler. 282,401, 1-28-86, Cl. D24-26.000.
Kraus, Walter F.: *See*—
Kapper, Henry; Kraus, Walter F.; and Wittkamp, Joel M., 282,363, Cl. D14-63.000.
Lam, Yanta, to Meyer Manufacturing Company Ltd. Base for a cooking pot or the like. 282,340, 1-28-86, Cl. D7-387.000.
Lambiase, Fredrick. Extendible pedestal table. 282,322, 1-28-86, Cl. D6-430.000.
Larson, Craig A.; and Darr, Richard C., to Plastipak Packaging, Inc. Plastic bottle. 282,349, 1-28-86, Cl. D9-395.000.
Laslo, Larry R., to American Commercial, Incorporated. Tureen. 282,332, 1-28-86, Cl. D7-17.000.
Lloyd's Carpet & Furniture Cleaning, Inc.: *See*—
Weaver, Lloyd J., 282,396, Cl. D23-162.000.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Diskette storage container. 282,313, 1-28-86, Cl. D3-35.000.
Maekawa, Tomohiro; and Nibley, Richard, to Canon Kabushiki Kaisha. Electronic typewriter. 282,374, 1-28-86, Cl. D18-1.000.
Makihara, Kendo: *See*—
Yamagata, Hiroshi; and Makihara, Kendo, 282,360, Cl. D14-59.000.
Martin, Ed; and Truette, Dan, to Pelton & Crane Company. X-ray viewer. 282,397, 1-28-86, Cl. D24-2.000.
Matsuda, Hiroaki: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 282,383, Cl. D21-63.000.
Matsushita Graphic Communication Systems, Inc.: *See*—
Hayashida, Nobuhiro, 282,365, Cl. D14-94.000.
McBride, James, to American Commercial Incorporated. Cup. 282,330, 1-28-86, Cl. D7-9.000.
McGarvey, John N.: *See*—
Campbell, John S.; Engstrom, John G.; and McGarvey, John N., 282,358, Cl. D14-52.000.

Meier, Richard, to Knoll International, Inc. Table base. 282,325, 1-28-86, Cl. D6-495.000.
Merrels, Frederic P. Lapel pin. 282,354, 1-28-86, Cl. D11-96.000.
Meyer Manufacturing Company Ltd.: *See*—
Lam, Yanta, 282,340, Cl. D7-387.000.
Miami Products & Chemicals Co.: *See*—
Stafford, David A., 282,399, Cl. D24-17.000.
Moll, Lester W.: *See*—
Schmidt, Friedrich W.; and Moll, Lester W., 282,402, Cl. D24-29.000.
Morrison, Richard E.: *See*—
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, 282,342, Cl. D7-398.000.
Murakami, Osamu: *See*—
Takahashi, Masaki; and Murakami, Osamu, 282,373, Cl. D18-1.000.
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Musical toy. 282,383, 1-28-86, Cl. D21-63.000.
Neff, Paul J. Storage unit. 282,327, 1-28-86, Cl. D6-570.000.
Nibley, Richard: *See*—
Maekawa, Tomohiro; and Nibley, Richard, 282,374, Cl. D18-1.000.
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.). Stove. 282,395, 1-28-86, Cl. D23-121.000.
Nord, Russell H.; Williams, Garry A.; and Rose, Frederick A., to Noriand Corporation. Digital oscilloscope. 282,351, 1-28-86, Cl. D10-76.000.
Norland Corporation: *See*—
Nord, Russell H.; Williams, Garry A.; and Rose, Frederick A., 282,351, Cl. D10-76.000.
Northern Telecom Limited: *See*—
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., 282,361, Cl. D14-60.000.
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., 282,362, Cl. D14-63.000.
Odagawa, Kazuyoshi: *See*—
Kikuchi, Nobuo; and Odagawa, Kazuyoshi, 282,376, Cl. D18-7.000.
Ogren, Lars, to ITT Industries, Inc. Combined submersible suspension mixer and rack. 282,370, 1-28-86, Cl. D15-147.000.
Ohyabu, Toshiharu; and Hasegawa, Masayuki, to Shachihata Industry Co., Ltd. Marking pen. 282,378, 1-28-86, Cl. D19-43.000.
Okamoto, Kenzo: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 282,395, Cl. D23-121.000.
Omark Industries: *See*—
de Villiers, Simon, 282,369, Cl. D15-139.000.
Optyl Eyewear Fashion International Corporation: *See*—
Blaimschein, Josef, 282,372, Cl. D16-102.000.
Parks, John R.; and Tozzer, Thomas W. Cuff link or similar article. 282,311, 1-28-86, Cl. D2-417.000.
Pashman, Neal K., to Wichcraft Prodco, Inc. Rifle bolt. 282,388, 1-28-86, Cl. D22-7.000.
Pelton & Crane Company: *See*—
Martin, Ed; and Truette, Dan, 282,397, Cl. D24-2.000.
Pichler, Oswald, to Trak Sportartikel GmbH. Applique for cross country skis. 282,387, 1-28-86, Cl. D21-230.000.
Picozza, Augusto A., to Dart Industries Inc. Adjustable carrier for containers. 282,337, 1-28-86, Cl. D7-70.000.
Pinder, Kenwood E. Bottle opener. 282,343, 1-28-86, Cl. D8-40.000.
Pioch, Peter-Paul, to Black & Decker Inc. Chop saw. 282,346, 1-28-86, Cl. D8-66.000.
Plastex Technology (Curacao) N.V.: *See*—
Gell, Peter L., 282,357, Cl. D14-11.000.
Plastipak Packaging, Inc.: *See*—
Larson, Craig A.; and Darr, Richard C., 282,349, Cl. D9-395.000.
Pounder, Edwin: *See*—
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, 282,342, Cl. D7-398.000.
Pozzi, Ambrogio, to F.Lli Guzzini S.p.A. Beverage tumbler. 282,331, 1-28-86, Cl. D7-14.000.
PPG Industries, Inc.: *See*—
Dick, H. Wayne, 282,312, Cl. D3-24.000.
Pretty Products, Inc.: *See*—
Bell, Ted A., 282,326, Cl. D6-566.000.
PTC Aerospace Inc.: *See*—
Dodd, Malcolm J.; and Juhas, Joseph A., 282,335, Cl. D7-38.000.
Putt, Arthur G. Taco holder. 282,338, 1-28-86, Cl. D7-76.000.
Quaker Oats Company, The: *See*—
Argandona, Augusto, 282,385, Cl. D21-115.000.
Qualitrol Corporation: *See*—
Johnson, Wendell D., 282,393, Cl. D23-20.000.
Rawson, Paul O.: *See*—
Guy, Thomas D.; Rawson, Paul O.; and Yagami, Richard H., 282,400, Cl. D24-26.000.
Read, Clifford D.: *See*—
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., 282,361, Cl. D14-60.000.
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., 282,362, Cl. D14-63.000.
Rogers, Colin W.: *See*—
Smith, Joseph; and Rogers, Colin W., 282,379, Cl. D19-52.000.
Rose, Frederick A.: *See*—
Nord, Russell H.; Williams, Garry A.; and Rose, Frederick A., 282,351, Cl. D10-76.000.
Sakai, Koichi: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 282,395, Cl. D23-121.000.
Sanyo Electric Co., Ltd.: *See*—
Takahashi, Hiroshi; Arai, Shu; Kishimoto, Yasuhiro; and Tomimatsu, Kiyoshi, 282,364, Cl. D14-64.000.
Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 282,367, Cl. D15-10.000.
Satake, Toshihiko, to Satake Engineering Co., Ltd. Grain sorter. 282,367, 1-28-86, Cl. D15-10.000.
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, to Coca-Cola Company, The; and Transdynamics, Inc. Beverage dispenser valve. 282,342, 1-28-86, Cl. D7-398.000.
Schmidt, Friedrich W.; and Moll, Lester W., to Sharpoint, Inc. Surgical knife blade. 282,402, 1-28-86, Cl. D24-29.000.
Schwartz, Frederic W., to Cable Electronic Products, Inc. Telephone answering unit or similar article. 282,356, 1-28-86, Cl. D14-4.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Telephone or similar article. 282,359, 1-28-86, Cl. D14-53.000.
Service Ideas, Inc.: *See*—
Collins, Harry F., 282,336, Cl. D7-58.000.
Shachihata Industry Co., Ltd.: *See*—
Ohyabu, Toshiharu; and Hasegawa, Masayuki, 282,378, Cl. D19-43.000.
Shackelford, John T., to Aspen Laboratories, Inc. Suction coagulator. 282,403, 1-28-86, Cl. D24-54.000.
Sharp Corporation: *See*—
Yamagata, Hiroshi; and Makihara, Kendo, 282,360, Cl. D14-59.000.
Sharpoint, Inc.: *See*—
Schmidt, Friedrich W.; and Moll, Lester W., 282,402, Cl. D24-29.000.
Smith, Albert W. Combined erectable hydraulic drilling rig and transport trailer. 282,368, 1-28-86, Cl. D15-21.000.
Smith, Joseph; and Rogers, Colin W. Drawing board. 282,379, 1-28-86, Cl. D19-52.000.
Sport Engineering Limited: *See*—
Dealey, Michael J.; and Fowell, Ian G. G., 282,386, Cl. D21-192.000.
Sportsman's Enterprises: *See*—
Hill, Clarence E., 282,389, Cl. D22-13.000.
Stafford, David A., to Miami Products & Chemicals Co. Water analysis laboratory. 282,399, 1-28-86, Cl. D24-17.000.
Steiner Company, Inc.: *See*—
Steiner, Robert L., 282,347, Cl. D9-403.000.
Steiner, Robert L., to Steiner Company, Inc. Soap container. 282,347, 1-28-86, Cl. D9-403.000.
Syroco, Inc.: *See*—
Brescia, Anthony J.; and Harris, Shurley, 282,328, Cl. D6-570.000.
Takahashi, Hiroshi; Arai, Shu; Kishimoto, Yasuhiro; and Tomimatsu, Kiyoshi, to Sanyo Electric Co., Ltd. Wireless telephone handset. 282,364, 1-28-86, Cl. D14-64.000.
Takahashi, Masaki; and Murakami, Osamu, to Canon Kabushiki Kaisha. Electronic typewriter. 282,373, 1-28-86, Cl. D18-1.000.
Thomas, Richard C.; and Daniels, David J., to British Gas Corporation. Portable receiver unit for a metallic object detector. 282,350, 1-28-86, Cl. D10-47.000.
Tomimatsu, Kiyoshi: *See*—
Takahashi, Hiroshi; Arai, Shu; Kishimoto, Yasuhiro; and Tomimatsu, Kiyoshi, 282,364, Cl. D14-64.000.
Tompkins, Thomas: *See*—
Korthoff, Herbert W.; and Tompkins, Thomas, 282,401, Cl. D24-26.000.
'totes', incorporated: *See*—
Allen, James H., 282,315, Cl. D3-71.000.
Tozzer, Thomas W.: *See*—
Parks, John R.; and Tozzer, Thomas W., 282,311, Cl. D2-417.000.
Trak Sportartikel GmbH: *See*—
Pichler, Oswald, 282,387, Cl. D21-230.000.
Transdynamics, Inc.: *See*—
Saunders, William J.; Bruffey, Robert D., Jr.; Pounder, Edwin; Morrison, Richard E.; and Cojulun, Carlos, 282,342, Cl. D7-398.000.
Trisch, Gene A. Fishing lure. 282,391, 1-28-86, Cl. D22-29.000.
Truette, Dan: *See*—
Martin, Ed; and Truette, Dan, 282,397, Cl. D24-2.000.
United States Surgical Corporation: *See*—
Guy, Thomas D.; Rawson, Paul O.; and Yagami, Richard H., 282,400, Cl. D24-26.000.
Korthoff, Herbert W.; and Tompkins, Thomas, 282,401, Cl. D24-26.000.
Valori, Peter, to Button Fronts (London) Limited. Ladybird boot. 282,309, 1-28-86, Cl. D2-273.000.
Valori, Peter, to Button Fronts (London) Ltd. Boot. 282,310, 1-28-86, Cl. D2-273.000.
Veeder Industries Inc.: *See*—
Dolson, Richard G., 282,375, Cl. D18-6.000.
Waldron, Patrick: *See*—
Christa, Carol; and Waldron, Patrick, 282,321, Cl. D6-381.000.
Weaver, Lloyd J., to Lloyd's Carpet & Furniture Cleaning, Inc. Carpet dryer. 282,396, 1-28-86, Cl. D23-162.000.
Wei, Yung-Kuan, to Wu, Chung-Yi. Insulated beverage bottle. 282,339, 1-28-86, Cl. D7-77.000.
Wichcraft Prodco, Inc.: *See*—
Pashman, Neal K., 282,388, Cl. D22-7.000.

Wilcox, Henry B. Automotive trim clip tool. 282,344, 1-28-86, Cl. D8-16.000.
Williams, Garry A.: *See*—
Nord, Russell H.; Williams, Garry A.; and Rose, Frederick A., 282,351, Cl. D10-76.000.
Wittkamp, Joel M.: *See*—
Kapper, Henry; Kraus, Walter F.; and Wittkamp, Joel M., 282,363, Cl. D14-63.000.
Womack, James A.: *See*—
Long, Jerry M.; and Womack, James A., 282,313, Cl. D3-35.000.
Wong, Christine C. L. Pendant. 282,353, 1-28-86, Cl. D11-82.000.
Wu, Chung-Yi: *See*—
Wei, Yung-Kuan, 282,339, Cl. D7-77.000.
Yagami, Richard H.: *See*—
Guy, Thomas D.; Rawson, Paul O.; and Yagami, Richard H., 282,400, Cl. D24-26.000.
Yamagata, Hiroshi; and Makihara, Kendo, to Sharp Corporation. Intercommunication unit. 282,360, 1-28-86, Cl. D14-59.000.
Yindra, Leonard J., to Hamilton Industries. Stirrup for medical examination table. 282,398, 1-28-86, Cl. D24-7.000.
Young, Cecil G.: *See*—
Ford, Harold A.; and Young, Cecil G., 282,390, Cl. D22-18.000.

LIST OF PLANT PATENTEES

Casselman, deceased, Arthur R.; and Casselman, Jessie M., legal representative. Plum tree "Ray's Hope". 5,650, 1-28-86, Cl. 38.000.
Casselman, Jessie M., legal representative: *See*—
Casselman, deceased, Arthur R.; and Casselman, Jessie M., legal representative, 5,650, Cl. 38.000.
Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Discovered and asexually reproduced a certain new and distinct variety of asparagus plant. 5,652, 1-28-86, Cl. 89.000.
Herman, Julian, to Monrovia Nursery Company. *Olea europaea* cv. Monher. 5,649, 1-28-86, Cl. 33.000.
Ilsink, G. Peter, to Jackson & Perkins Company. Rose plant Interval. 5,648, 1-28-86, Cl. 23.000.
Jackson & Perkins Company: *See*—
Ilsink, G. Peter, 5,648, Cl. 23.000.
Warriner, William A., 5,645, Cl. 8.000.
Warriner, William A., 5,647, Cl. 15.000.
Kinelski, John J.: *See*—
Ellison, J. Howard; and Kinelski, John J., 5,652, Cl. 89.000.
Monrovia Nursery Company: *See*—
Herman, Julian, 5,649, Cl. 33.000.
Olesen, Mogens: *See*—
Olesen, Pernille; and Olesen, Mogens, 5,646, Cl. 12.000.
Olesen, Pernille; and Olesen, Mogens. Rose plant. 5,646, 1-28-86, Cl. 12.000.
Rutgers University: *See*—
Ellison, J. Howard; and Kinelski, John J., 5,652, Cl. 89.000.
Shults, Garfield, to Stark Brothers Nurseries & Orchards Company. Apricot tree—Homedale Cultivar. 5,651, 1-28-86, Cl. 39.000.
Stark Brothers Nurseries & Orchards Company: *See*—
Shults, Garfield, 5,651, Cl. 39.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacpo. 5,645, 1-28-86, Cl. 8.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacfar. 5,647, 1-28-86, Cl. 15.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 28, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

104 4,566,136
413 4,566,137

CLASS 4

255 4,566,139
324 4,566,140
506 4,566,141
604 4,566,142

CLASS 8

103 4,566,874
406 4,566,875
411 4,566,876

CLASS 14

16.5 4,566,143

CLASS 15

3 4,566,144
201 4,566,145
250.34 4,566,146
250.42 4,566,147
257.05 4,566,148
320 4,566,149

CLASS 16

332 4,566,150

CLASS 17

47 4,566,151

CLASS 19

81 4,566,152
98 4,566,153
296 4,566,154

CLASS 24

41 4,566,155
398 4,566,156
536 4,566,157
580 4,566,158
599 4,566,159
637 4,566,160
642 4,566,161

CLASS 26

105 4,566,162

CLASS 28

187 4,566,163

CLASS 29

33 M 4,566,164
121.6 4,566,165
156.8 R 4,566,166
437 4,566,167
517 4,566,168
560 4,566,169
569 L 4,566,170
4,566,171
571 4,566,172
4,566,173
576 B 4,566,175
576 W 4,566,174
578 4,566,176
590 4,566,177
594 4,566,178
596 4,566,179
4,566,180
602 R 4,566,181
715 4,566,182
813 B1 3,750,257
825 4,566,183
840 4,566,184
845 4,566,185
852 4,566,186
857 4,566,187

CLASS 30

166 A 4,566,188
276 4,566,189
373 4,566,190

CLASS 33

1 B 4,566,192
1 D 4,566,193
1 M 4,566,191
18.1 4,566,194
27.11 4,566,195
125 R 4,566,196
138 4,566,198
143 M 4,566,199
161 4,566,200
172 E 4,566,201
286 4,566,202

CLASS 34

9 4,566,203
15 4,566,204
232 4,566,205

CLASS 36

7.8 4,566,206
50 4,566,207
011 4,566,197
110 4,566,208
116 4,566,209

CLASS 40

449 4,566,210
605 4,566,211

CLASS 42

50 4,566,212

CLASS 43

1 4,566,213
3 4,566,214
4 4,566,215
17 4,566,216
19 4,566,217
58 4,566,218
107 4,566,219
113 4,566,220

CLASS 44

51 4,566,877
57 4,566,878
71 4,566,879

CLASS 47

41.12 4,566,221

CLASS 48

73 4,566,880

CLASS 49

56 4,566,222
264 4,566,223

CLASS 51

56 R 4,566,224
165.72 4,566,225
4,566,226
219 R 4,566,227
238 S 4,566,228
241 VS 4,566,229
420 4,566,230

CLASS 52

145 4,566,231
195 4,566,232
208 4,566,233
209 4,566,234
220 4,566,235
222 4,566,236
269 4,566,237
407 4,566,238
4,566,239
414 4,566,240
481 4,566,241
573 4,566,242
584 4,566,243
645 4,566,245
648 4,566,246
732 4,566,247

CLASS 53

48 4,566,248
55 4,566,249
128 4,566,250
167 4,566,251
410 4,566,252
451 4,566,253
588 4,566,244

CLASS 54

8 4,566,254
24 4,566,255

CLASS 55

25 4,566,881
100 4,566,882
329 4,566,883
357 4,566,884

CLASS 56

10.2 4,566,256
202 4,566,257
370 4,566,258

CLASS 57

6 4,566,259
22 4,566,260
212 4,566,261
264 4,566,262
276 4,566,263
314 4,566,264
336 4,566,265

CLASS 60

39.06 4,566,266
39.07 4,566,267
39.463 4,566,268
226.1 4,566,269
264 4,566,270
286 4,566,271
384 4,566,272
415 4,566,273
444 4,566,274
554 4,566,275
585 4,566,276
587 4,566,277
618 4,566,278
718 4,566,279
757 4,566,280

CLASS 62

9 4,566,885
11 4,566,886
21 4,566,887
48 4,566,281
4,566,282
49 4,566,283
52 4,566,284
129 4,566,285
135 4,566,286
188 4,566,287
196.1 4,566,288
228.4 4,566,289
304 4,566,290
402 4,566,291
457 4,566,292
514 R 4,566,293

CLASS 63

15 4,566,294

CLASS 65

1 4,566,888
3.2 4,566,889
12 4,566,890
4,566,891
59.24 4,566,892
69 4,566,893
304 4,566,894
319 4,566,895

CLASS 68

12 R 4,566,295

CLASS 70

56 4,566,296
57 4,566,297

CLASS 71

24 4,566,896
88 4,566,897
93 4,566,898
4,566,899
100 4,566,900
105 4,566,901

CLASS 72

6 4,566,298
8 4,566,299
63 4,566,300
75 4,566,301
146 4,566,302
262 4,566,303
319 4,566,304
321 4,566,305
346 4,566,306

CLASS 73

3 4,566,307
4 R 4,566,308
4,566,309
9 4,566,310
19 4,566,311
32 A 4,566,312
40.7 4,566,313
55 4,566,314
60 4,566,324
61.4 4,566,315
151 4,566,318
155 4,566,317
160 4,566,319
204 4,566,320
290 R 4,566,321
295 4,566,322
4,566,323
432 PS 4,566,326
432 R 4,566,325
510 4,566,327
517 B 4,566,328
597 4,566,329
599 4,566,330
632 4,566,331
639 4,566,332
642 4,566,333
649 4,566,334
754 4,566,316
772 4,566,336
849 4,566,335
861.56 4,566,337
862.36 4,566,338
862.39 4,566,339
862.48 4,566,340
862.65 4,566,341
863.03 4,566,342
864.59 4,566,343

CLASS 74

10.33 4,566,344
89.15 4,566,345
89.22 4,566,346
125 4,566,347
359 4,566,348
475 4,566,349
526 4,566,350
606 R 4,566,351
640 4,566,352
710.5 4,566,353
866 4,566,354
869 4,566,355

CLASS 75

26 4,566,902
4,566,903
38 4,566,904
244 4,566,905

CLASS 81

62 4,566,356
177.2 4,566,357

CLASS 82

38 A 4,566,358

CLASS 83

23 4,566,359
409 4,566,360
454 4,566,361

CLASS 84

1.03 4,566,362
1.08 4,566,363
1.19 4,566,364
317 4,566,365

CLASS 86

24 4,566,366

CLASS 89

1.810 4,566,367
26 4,566,368
45 4,566,369

CLASS 92

59 4,566,370
92 4,566,371
168 4,566,372

CLASS 98

2.01 4,566,373

CLASS 99

281 4,566,374
348 4,566,375
468 4,566,376
474 4,566,377

CLASS 100

26 4,566,378
89 4,566,379
4,566,380
121 4,566,381

CLASS 101

35 4,566,382
121 4,566,383
170 4,566,384
183 4,566,385
305 4,566,386
330 4,566,387

CLASS 102

361 4,566,388

CLASS 104

3 4,566,389
88 4,566,390

CLASS 105

215 R 4,566,391

CLASS 106

15.05 4,566,906
21 4,566,907
308 N 4,566,908

CLASS 110

165 R 4,566,392
261 4,566,393
347 4,566,394

CLASS 112

292 4,566,395
302 4,566,396

CLASS 114

56 4,566,397
293 4,566,398

CLASS 116

28 R 4,566,399
171 4,566,400
207 4,566,401

CLASS 118

653 4,566,402
718 4,566,403

CLASS 119

8 4,566,404
14.04 4,566,405

CLASS 122

405 4,566,406

CLASS 123

41.48 4,566,407
51 B 4,566,408
65 PE 4,566,409
179 BG 4,566,410
213 4,566,411
216 4,566,412
256 4,566,413
357 4,566,414
361 4,566,415
458 4,566,416
478 4,566,417
479 4,566,418
489 4,566,419
4,566,420
502 4,566,421
559 4,566,422
571 4,566,423
583 4,566,424
600 4,566,425

CLASS 125

11 R 4,566,426
16 R 4,566,427
21 4,566,428

CLASS 126

14 4,566,429
433 4,566,430
437 4,566,431
438 4,566,432
439 4,566,433
440 4,566,434
443 4,566,435

CLASS 127

33 4,566,909
70 4,566,910

CLASS 128

1 R 4,566,436
4 4,566,437
6 4,566,438
4,566,439
25 R 4,566,440
40 4,566,441
52 4,566,442
66 4,566,443
70 4,566,445
79 4,566,446
80 E 4,566,447
92 H 4,566,448
133 4,566,449
200.11 4,566,450
200.21 4,566,451
4,566,452
303 B 4,566,444
303.1 4,566,453
303.13 4,566,454
380 4,566,455
419 D 4,566,457
419 PG 4,566,456
478 4,566,458
660 4,566,459
4,566,460
668 4,566,461
677 4,566,462
682 4,566,463
732 4,566,464
778 4,566,465
781 4,566,466
784 4,566,467

CLASS 131

297 4,566,468
308 4,566,469
312 4,566,470
317 4,566,471

CLASS 132

70 4,567,039
112 4,566,472
120 4,566,473

CLASS 134

6 4,566,911
13 4,566,912

CLASS 135

69 4,566,474
99 4,566,475

CLASS 136

246 4,567,316

CLASS 137

71 4,566,476
101 4,566,477
112 4,566,478
271 4,566,480
296 4,566,481
312 4,566,479
315 4,566,482
372 4,566,483
375 4,566,485
403 4,566,484
469 4,566,486
597 4,566,487
613 4,566,488
614 4,566,489
625.65 4,566,490
625.66 4,566,491
636.1 4,566,492
846 4,566,493
872 4,566,494

CLASS 138

149 4,566,495
154 4,566,496

CLASS 139

1 C 4,566,497
26 4,566,498
59 4,566,499
446 4,566,500

CLASS 140

1 4,566,501
92.1 4,566,502
140 4,566,503

CLASS 141

59 4,566,504
83 4,566,505
160 4,566,506

169 Re.32,074
271 4,566,507
381 4,566,508
4,566,509

CLASS 144

1 C 4,566,510
1 F 4,566,511
134 D 4,566,512
208 E 4,566,513

CLASS 148

1.5 4,566,913
4,566,914
11.5 C 4,566,915
26 4,566,916
31.55 4,566,917
175 4,566,918

CLASS 149

20 4,566,919
21 4,566,920
22 4,566,921

CLASS 152

209 R 4,566,514
402 4,566,515

CLASS 156

64 4,566,922
69 4,566,923
73.5 4,566,924
86 4,566,925
165 4,566,926
203 4,566,927
217 4,566,928
242 4,566,929
280 4,566,930
330.9 4,566,931
429 4,566,932
444 4,566,933
622 4,566,934
626 4,566,935
627 4,566,936
628 4,566,937
643 4,566,938
4,566,940
4,566,941
655 4,566,939

CLASS 160

22 4,566,516
263 4,566,517

CLASS 162

4 4,566,942
168.2 4,566,943
286 4,566,944
343 4,566,945
359 4,566,946

CLASS 164

53 4,566,518
97 4,566,519
131 4,566,520
160.1 4,566,521
316 4,566,522
420 4,566,523
461 4,566,524
463 4,566,525
478 4,566,526

CLASS 165

1 4,566,527
26 4,566,528
32 4,566,529
36 4,566,530
42 4,566,531
45 4,566,532
95 4,566,533

CLASS 166

66.4 4,566,534
113 4,566,535
181 B1 4,270,606
251 4,566,536
261 4,566,537
278 4,566,538
307 4,566,539
317 4,566,540
318 4,566,541

CLASS 169

62 4,566,542

CLASS 172

4 4,566,543

CLASS 174

25 GC 4,567,318
35 MS 4,567,317
47 4,567,319
103 4,567,320
117 F 4,567,321

CLASS 175

4.56 4,566,544
226 4,566,545
297 4,566,546

CLASS 177

46 4,566,547
229 4,566,548
245 4,566,549

CLASS 179

2 A 4,567,322
4,567,328
6.3 R 4,567,325
17 E 4,567,330
18 B 4,567,323
18 FA 4,567,329
27 FH 4,567,324
84 T 4,567,333
90 B 4,567,326
115.5 R 4,567,327
170 NC 4,567,331
175 4,567,332

CLASS 180

8.2 4,566,550
4,566,707
9.1 4,566,551
69.21 4,566,552
237 4,566,553
249 4,566,554
274 4,566,555
287 4,566,556

CLASS 181

150 4,566,557
210 4,566,558

CLASS 182

224 4,566,559

CLASS 184

15.1 4,566,560

CLASS 187

20 4,566,561
22 4,566,562

CLASS 188

18 A 4,566,563
73.33 4,566,564
322.21 4,566,565

CLASS 191

21 4,567,334
59.1 4,567,335

CLASS 192

24 4,566,566
45 4,566,567
53 F 4,566,568
53 G 4,566,569
56 R 4,566,570
70.12 4,566,572
70.18 4,566,573
70.2 4,566,571
84 C 4,566,574
4,566,575
4,566,576
85 CA 4,566,577
98 4,566,578
113 B 4,566,579

CLASS 193

48 4,566,580

CLASS 194

248 4,566,581

CLASS 198

367 4,566,582
459 4,566,583
504 4,566,584
624 4,566,585
628 4,566,586
732 4,566,587

CLASS 200

144 B 4,567,338
153 LB 4,567,339
305 4,567,336
331 4,567,337

CLASS 203

26 4,566,947
51 4,566,948

CLASS 204

1 T 4,566,949
4,566,950
12 4,566,951
27 4,566,952
28 4,566,953
4,566,954
59 R 4,566,955
72 4,566,956
73 A 4,566,957
129.75 4,566,958
4,566,959
4,566,960
157.2 4,567,025
168 4,566,961
180.9 4,566,962
181.7 4,566,963

CLASS 206

0.6 4,566,589
3 4,566,588
232 4,566,590
427 4,566,591
449 4,566,592
611 4,566,593

CLASS 208

8 LE 4,566,964
11 R 4,566,965
113 4,566,966
135 4,566,967

CLASS 209

539 4,566,594
545 4,566,595

CLASS 210

221.1 4,566,968
387 4,566,969
409 4,566,970
616 4,566,971
698 4,566,972
701 4,566,973
4,566,974
711 4,566,975

CLASS 211

59.2 4,566,596
87 4,566,597
96 4,566,598

CLASS 212

160 4,566,599

CLASS 215

1 C 4,566,600
31 4,566,601
256 4,566,602
329 4,566,603

CLASS 219

10.41 4,567,340
10.55 E 4,567,341
69 M 4,567,342
74 4,567,343
98 4,567,344
121 PB 4,567,346
121 PT 4,567,345
124.54 4,567,347
4,567,348
216 4,567,349
298 4,567,350
341 4,567,351
405 4,567,352
501 4,567,353

CLASS 220

68 4,566,604
90.2 4,566,605

CLASS 221

25 4,566,606
155 4,566,607
229 4,566,608

CLASS 222

130 4,566,609
137 4,566,610
153 4,566,611
309 4,566,612
541 4,566,613
603 4,566,614

CLASS 223

43 4,566,615

CLASS 224

253 4,566,616
275 4,566,617

CLASS 226

74 4,566,618

CLASS 227

8 4,566,619
19 4,566,620
109 4,566,621
120 4,566,622

CLASS 228

138 4,566,623
180.1 4,566,624
265 4,566,625

CLASS 229

37 R 4,566,626
81 4,566,627

CLASS 235

145 R 4,567,354
310 4,567,355
375 4,567,356
377 4,567,357
379 4,567,358
381 4,567,359
455 4,567,360
462 4,567,361

CLASS 237

8 C 4,566,628

CLASS 238

117 4,566,629
292 4,566,630
349 4,566,631

CLASS 239

230 4,566,632
237 4,566,633
410 4,566,634
533.8 4,566,635
698 4,566,636

CLASS 241

23 4,566,637
37 4,566,638
52 4,566,639
74 4,566,640
200 4,566,641

CLASS 242

18 R 4,566,642
4,566,643
35.5 A 4,566,644
35.5 R 4,566,645
45 4,566,646
67.1 R 4,566,647
67.3 R 4,566,648
107.4 A 4,566,649
4,566,650
150 R 4,566,651
189 4,566,652
199 4,566,653
204 4,566,654
215 4,566,655

CLASS 244

3.11 4,566,656
12.2 4,566,699
90 A 4,566,657
110 R 4,566,658
137 R 4,566,659

CLASS 248

74.2 4,566,660
171 4,566,661
222.1 4,566,662
324 4,566,663
349 4,566,664
495 4,566,665
558 4,566,666
561 4,566,667

CLASS 249

60 4,566,668
160 4,566,669

CLASS 250

201 4,567,362
214 A 4,567,363
307 4,567,364
338 4,567,365
339 4,567,366
340 4,567,367
379 4,567,368
397 4,567,369
461.1 4,567,370
483.1 4,567,371
560 4,567,372
573 4,567,373
578 4,567,374

CLASS 251

58 4,566,670
159 4,566,671
192 4,566,672

CLASS 252

8.5 A 4,566,976
8.5 C 4,566,977
4,566,978
8.55 C 4,566,979
8.6 4,566,980
8.8 4,566,981
33.6 4,566,982
56 R 4,566,983
140 4,566,984
174.12 4,566,985
175 4,566,986
301.4 F 4,566,987
373 4,566,988
478 4,566,989
503 4,566,990
512 4,566,991
518 4,566,992
559 4,566,993
574 4,566,994

CLASS 254

84 4,566,673
345 4,566,674
360 4,566,675

CLASS 260

105 4,566,997
239 A 4,566,996
239.3 B 4,566,995
369 4,566,998
392 4,566,999
397.3 4,567,000
4,567,001
397.4 4,567,002
458 F 4,567,003
465 D 4,567,005
465 R 4,567,004

CLASS 264

22 4,567,006
29.5 4,567,007
40.5 4,567,008
41 4,567,009
117 4,567,010
504 4,567,011

CLASS 266

48 4,566,676

CLASS 267

140.1 4,566,677
141.1 4,566,678

CLASS 269

23 4,566,679
74 4,566,680

CLASS 270

58 4,566,681

CLASS 271

90 4,566,682
98 4,566,683
117 4,566,684
150 4,566,685
201 4,566,686
202 4,566,687

CLASS 272

53.1 4,566,688
69 4,566,689
123 4,566,690
4,566,691
130 4,566,692
144 4,566,693

CLASS 273

1 GB 4,566,694
73 D 4,566,695
193 A 4,566,696
241 4,566,697
249 4,566,698

CLASS 277

53 4,566,700
58 4,566,701
121 4,566,702
165 4,566,703
207 A 4,566,704

CLASS 279

4 4,566,705

CLASS 280

5.22 4,566,706
47.13 R 4,566,708
91 4,566,709
4,566,710
4,566,711
272 4,566,712
287 4,566,713
404 4,566,714
434 4,566,715
439 4,566,716
701 4,566,717
708 4,566,718
711 4,566,719

CLASS 281

15 R 4,566,720
31 4,566,721

CLASS 285

18 4,566,722
86 4,566,723
364 4,566,724

CLASS 292

191 4,566,725

CLASS 294

64.3 4,566,726
88 4,566,727

CLASS 296

76 4,566,728
159 4,566,729
221 4,566,730

CLASS 297

45 4,566,731
174 4,566,732
284 4,566,733
346 4,566,734
452 4,566,735

CLASS 299

23 4,566,736

CLASS 303

109 4,566,737

CLASS 307

98 4,567,375
106 4,567,376
112 4,567,377
270 4,567,378
4,567,379
290 4,567,380
296 R 4,567,381
400 4,567,382
415 4,567,383
442 4,567,384
443 4,567,385
481 4,567,386
530 4,567,387
4,567,389
540 4,567,388

CLASS 308

3 A 4,566,738
3 R 4,566,739
10 4,566,740

CLASS 310

68 C 4,567,390
156 4,567,391
313 A 4,567,392
4,567,393
330 4,567,394
338 4,567,395

CLASS 312

194 4,566,741
257 SK 4,566,742
350 4,566,743

CLASS 313

25 4,567,396
318 4,567,397
362.1 4,567,398
449 4,567,399
457 4,567,400

CLASS 315

5 4,567,401
5.33 4,567,406
39.3 4,567,402
47 4,567,403
205 4,567,404
392 4,567,405

CLASS 318

140 4,567,407
317 4,567,408
327 4,567,409
332 4,567,410
341 4,567,411
483 4,567,412
489 4,567,413
542 4,567,414
565 4,567,415
602 4,567,416
632 4,567,417
685 4,567,418
798 4,567,419
803 4,567,420

CLASS 320

30 4,567,421

CLASS 322

25 4,567,422
58 4,567,423

CLASS 323

210 4,567,424
237 4,567,425
315 4,567,426

CLASS 324

64 4,567,427
73 PC 4,567,428
99 D 4,567,429
158 D 4,567,430
158 F 4,567,432
158 P 4,567,433
158 R 4,567,431
160 4,567,434
207 4,567,435
230 4,567,436
237 4,567,437
248 4,567,438
304 4,567,439
309 4,567,440

CLASS 329

103 4,567,441
145 4,567,442

CLASS 330

149 4,567,443
257 4,567,444
300 4,567,445
308 4,567,446

CLASS 331

1 A 4,567,447
25 4,567,448
56 4,567,449
107 DP 4,567,450
155 4,567,451

CLASS 332

7 4,567,452

CLASS 333

194 4,567,453
206 4,567,454

CLASS 335

16 4,567,455
20 4,567,456
128 4,567,457

CLASS 337

365 4,567,458

CLASS 339

8 L 4,566,744
14 P 4,566,745
60 R 4,566,746
74 R 4,566,747
95 D 4,566,748
4,566,749
126 R 4,566,750
218 S 4,566,751
262 R 4,566,752

CLASS 340

58 4,567,459
4,567,460
323 R 4,567,461
347 AD 4,567,465
4,567,466
347 DA 4,567,463
4,567,468
347 DD 4,567,464
347 P 4,567,462
4,567,467
365 C 4,567,470
365 S 4,567,469
513 4,567,471
525 4,567,472
572 4,567,473
584 4,567,474
634 4,567,475
636 4,567,476
644 4,567,477
705 4,567,478
709 4,567,479
712 4,567,480
784 4,567,481
825.05 4,567,482
970 4,567,483

CLASS 343

14 4,567,484
358 4,567,485
401 4,567,486
900 4,567,487

CLASS 346

76 PH 4,567,488
4,567,489
135.1 4,567,490
136 4,567,491
4,567,492
140 R 4,567,493
4,567,494
153.1 4,567,495
200 4,567,496
4,567,497
216 4,567,498

CLASS 350

96.16 4,566,753
96.30 4,566,754
96.34 4,566,755
126 4,566,756
162.12 4,566,757
346 4,566,758
4,566,759
358 4,566,760
401 4,566,761
411 4,566,762
441 4,566,763
459 4,566,764
619 4,566,765

CLASS 353

122 4,566,766

CLASS 354

76 4,566,767
81 4,566,768
145.1 4,566,769
276 4,566,770
283 4,566,771
303 4,566,772
403 4,566,773
413 4,566,774
432 4,566,775

CLASS 355

3 DD 4,566,776
3 FU 4,566,778
3 R 4,566,777
4,566,779
4,566,780
10 4,566,781
14 FU 4,566,783
14 SH 4,566,782
72 4,566,784
4,566,785
77 4,566,786
100 4,566,787

CLASS 356

4 4,566,788
241 4,566,789
246 4,566,790
4,566,791
319 4,566,792
4,566,793
350 4,566,794
400 4,566,795
401 4,566,796
402 4,566,797
448 4,566,798

CLASS 357

2 4,567,499
38 4,567,500
51 4,567,501
53 4,567,502
54 4,567,503
79 4,567,504
81 4,567,505

CLASS 358

11 4,567,506
4,567,507
4,567,508
29 4,567,509
44 4,567,510
84 4,567,511
86 4,567,512
92 4,567,513
100 4,567,514
107 4,567,515
114 4,567,516
120 4,567,517
133 4,567,518
135 4,567,519
139 4,567,520
150 4,567,521
158 4,567,522
191.1 4,567,523
213 4,567,524
4,567,525
227 4,567,526
282 4,567,527
285 4,567,528
294 4,567,529
295 4,567,530
335 4,567,531
342 4,567,532
4,567,533
4,567,534

CLASS 360

77 Re.32,075
87 4,567,535
94 4,567,536

CLASS 361

18 4,567,537
58 4,567,538
92 4,567,539
93 4,567,540
235 4,567,541
321 4,567,542
398 4,567,543
399 4,567,544
401 4,567,545
420 4,567,546

CLASS 362

154 4,567,547
161 4,567,548
279 4,567,549
297 4,567,550
398 4,567,551

CLASS 363

87 4,567,552
98 4,567,553
138 4,567,554
4,567,555

CLASS 364

140 4,567,556
145 4,567,557
148 4,567,558
183 4,567,559
184 4,567,560
200 4,567,561
4,567,562
420 4,567,563
434 4,567,564
520 4,567,565
554 4,567,566
709 4,567,567
761 4,567,568
845 4,567,569
900 4,567,570
4,567,571
4,567,572
4,567,573
4,567,574
4,567,575
B1 4,231,105

CLASS 365

2 4,567,576
156 4,567,577
189 4,567,578
4,567,579
200 4,567,580
230 4,567,581

CLASS 366

1 4,566,799
118 4,566,800
343 4,566,801

CLASS 367

56 4,567,582
190 4,567,583

CLASS 368

9 4,566,802
66 4,566,803

CLASS 369

38 4,567,584
97 4,567,585

CLASS 370

4 4,567,586
13 4,567,587
18 4,567,588
58 4,567,589
86 4,567,590
109 4,567,591

CLASS 371

20 4,567,592
25 4,567,593
38 4,567,594
49 4,567,595

CLASS 372

22 4,567,596
34 4,567,597
36 4,567,598

CLASS 374

14 4,566,804
16 4,566,805
53 4,566,806
112 4,566,807
124 4,566,808
126 4,566,809

CLASS 375

2.1 4,567,600
14 4,567,599
22 4,567,601
60 4,567,602
65 4,567,603
87 4,567,604

CLASS 376

245 4,567,012
247 4,567,013
272 4,567,014
4,567,015
283 4,567,016
417 4,567,017
435 4,567,018

CLASS 378

85 4,567,605

CLASS 381

1 4,567,607
43 4,567,606
122 4,567,608

CLASS 382

9 4,567,609
18 4,567,610

CLASS 384

280 4,566,810
484 4,566,811
4,566,812

CLASS 400

120 4,566,813
354.1 4,566,814
641 4,566,815

CLASS 401

219 4,566,816

CLASS 402

38 4,566,817

CLASS 403

172 4,566,818
385 4,566,819

CLASS 404

14 4,566,820
35 4,566,821
84 4,566,822
98 4,566,823

CLASS 405

202 4,566,824
267 4,566,825

CLASS 407

37 4,566,826
42 4,566,827
48 4,566,828

CLASS 408

239 R 4,566,829

CLASS 409

182 4,566,830

CLASS 410

117 4,566,831

CLASS 411

21 4,566,832

CLASS 414

27 4,566,834
30 4,566,833
53 4,566,835
57 4,566,836
222 4,566,837
278 4,566,838
404 4,566,839
408 4,566,840
417 4,566,841
462 4,566,842
680 4,566,843
726 4,566,844
735 4,566,845
742 4,566,846
744 R 4,566,847
749 4,566,848

CLASS 415

92 4,566,849
128 4,566,850
139 4,566,851
182 4,566,852

CLASS 416

117 4,566,853
119 4,566,854
134 A 4,566,856
134 R 4,566,855
220 R 4,566,857

CLASS 417

22 4,566,858
50 4,566,859
54 4,566,861
102 4,566,860
189 4,566,862
295 4,566,863
353 4,566,864
363 4,566,865
366 4,566,866
393 4,566,867
572 4,566,868

CLASS 418

15 4,566,869
30 4,566,870

CLASS 422

56 4,567,024
57 4,567,019
101 4,567,020
102 4,567,021
144 4,567,022
192 4,567,023

CLASS 423

81 4,567,026
101 4,567,027
300 4,567,028
306 4,567,029
326 4,567,030
593 4,567,031
644 4,567,032
648 R 4,567,033

CLASS 424

5 4,567,034
47 4,567,035
51 4,567,036
59 4,567,037
4,567,038
70 4,567,040
87 4,567,041
89 4,567,042
4,567,043
94 4,567,044
195.1 4,567,045

CLASS 425

525 4,566,871

CLASS 426

20 4,567,046
94 4,567,047
250 4,567,048
275 4,567,049
417 4,567,050
438 4,567,051
532 4,567,052
538 4,567,053
548 4,567,054
578 4,567,055
607 4,567,056

CLASS 427

48 4,567,057
55 4,567,058
79 4,567,059
87 4,567,060
93 4,567,061
96 4,567,062
128 4,567,063
157 4,567,064
230 4,567,065
305 4,567,066
328 4,567,067

CLASS 428

31 4,567,068
35 4,567,069
4,567,070
4,567,071
40 4,567,072
4,567,073
71 4,567,074
91 4,567,075
102 4,567,076
114 4,567,077
119 4,567,078
131 4,567,079
137 4,567,080
138 4,567,081
4,567,082
141 4,567,083
150 4,567,084
163 4,567,085
166 4,567,086
211 4,567,087
213 4,567,088
4,567,089
214 4,567,090
222 4,567,091
246 4,567,092
250 4,567,093
256 4,567,094
314.4 4,567,095
315.5 4,567,096
317.7 4,567,097
327 4,567,098
4,567,099
339 4,567,100
364 4,567,101
391 4,567,102
408 4,567,103
410 4,567,104
412 4,567,105
413 4,567,106
425.5 4,567,107
425.9 4,567,108
4,567,109
433 4,567,110
457 4,567,111
461 4,567,112
480 4,567,113
4,567,114
541 4,567,115
694 4,567,116

CLASS 429

19 4,567,117
53 4,567,118
59 4,567,119
72 4,567,120
181 4,567,121

CLASS 430

4 4,567,122
4,567,123
58 4,567,125
59 4,567,124
4,567,126
65 4,567,127
294 4,567,129
4,567,130
309 4,567,131
312 4,567,132
313 4,567,128
348 4,567,133
372 4,567,134
505 4,567,135

CLASS 435

4 4,567,136
13 4,567,137
15 4,567,138
28 4,567,139
42 4,567,140
91 4,567,141
94 4,567,142
119 4,567,143
134 4,567,144
161 4,567,145
172.3 4,567,146
237 4,567,147

CLASS 436

66 4,567,148
87 4,567,150
513 4,567,149

CLASS 474

101 4,566,872

CLASS 494

53 4,566,873

CLASS 501

15 4,567,151

CLASS 502

64 4,567,152
113 4,567,153
114 4,567,154
123 4,567,155
173 4,567,156
208 4,567,157
209 4,567,158
219 4,567,159
326 4,567,160

CLASS 514

16 4,567,162
23 4,567,161
29 4,567,163
33 4,567,164
36 4,567,165
82 4,567,166
89 4,567,167
4,567,168
089 4,567,169
128 4,567,170
150 4,567,171
179 4,567,172
188 4,567,173
210 4,567,174
211 4,567,175
212 4,567,176
214 4,567,177
215 4,567,178
225 4,567,179
253 4,567,180
256 4,567,181
262 4,567,182
264 4,567,183
277 4,567,184
282 4,567,185
300 4,567,186
312 4,567,187
332 4,567,188
338 4,567,189
343 4,567,190
362 4,567,191
369 4,567,192
381 4,567,193
400 4,567,194
419 4,567,195
422 4,567,196
452 4,567,197
513 4,567,198
531 4,567,199
547 4,567,200
571 4,567,201
656 4,567,202
844 4,567,203

CLASS 518

700 4,567,204
715 4,567,205

CLASS 521

27 4,567,206
35 4,567,207
59 4,567,208
81 4,567,209
90 4,567,210
98 4,567,211
122 4,567,212

CLASS 523

117 Re.32,073
160 4,567,213
216 4,567,214
218 4,567,215

CLASSIFICATION OF PATENTS

400 4,567,216

CLASS 524

296 4,567,217
373 4,567,218
413 4,567,219
4,567,220
436 4,567,221
476 4,567,222
489 4,567,223
494 4,567,224
526 4,567,225
538 4,567,226
4,567,227
588 4,567,228
610 4,567,229
786 4,567,230
837 4,567,231

CLASS 525

53 4,567,232
71 4,567,233
73 4,567,234
113 4,567,235
127 4,567,236
170 4,567,237
179 4,567,238
187 B1 4,251,648
309 4,567,239
328.1 4,567,240
352 4,567,241
534 4,567,242

CLASS 526

128 4,567,243
160 4,567,244
279 4,567,245
318.44 4,567,246

CLASS 528

190 4,567,247
211 4,567,248
347 4,567,249
423 4,567,250
487 4,567,251

CLASS 534

882 4,567,252

CLASS 536

18.1 4,567,253
27 4,567,254
30 4,567,255

CLASS 544

58.2 4,567,256
78 4,567,257
192 4,567,258
207 4,567,259
250 4,567,260
251 4,567,261
4,567,262
263 4,567,263
400 4,567,264

CLASS 546

16 4,567,265
82 4,567,266
114 4,567,267
116 4,567,268
167 4,567,269
183 4,567,270
271 4,567,271
281 4,567,272
345 4,567,273
4,567,274

CLASS 548

128 4,567,275
306 4,567,277
309 4,567,278
343 4,567,276
491 4,567,279

CLASS 549

43 4,567,280
288 4,567,281
450 4,567,282
546 4,567,283

CLASS 556

37 4,567,284
137 4,567,285
469 4,567,286

CLASS 560

37 4,567,288
024 4,567,287
059 4,567,289
124 4,567,290
225 4,567,291
245 4,567,292

CLASS 562

496 4,567,293
555 4,567,294

CLASS 564

44 4,567,295
111 4,567,296
208 4,567,297
214 4,567,299
215 4,567,298
4,567,300
243 4,567,301
286 4,567,302
475 4,567,303

CLASS 568

385 4,567,304
454 4,567,305
455 4,567,306
861 Re.32,072

CLASS 585

330 4,567,307
375 4,567,308
408 4,567,310
415 4,567,311
419 4,567,312
480 4,567,313
621 4,567,314
827 4,567,315
829 4,567,309

CLASS 623

22 4,566,138

CLASSIFICATION OF DESIGNS

D2— 247 282,308
273 282,309
282,310
417 282,311
D3— 24 282,312
35 282,313
282,314
71 282,315
D4— 104 282,316
282,317
282,318
115 282,319
D6— 300 282,320
381 282,321
430 282,322
462 282,323
475 282,324
495 282,325
566 282,326
570 282,327
282,328
D7— 8 282,329
9 282,330
14 282,331
17 282,332
18 282,333
36 282,334
38 282,335
58 282,336
70 282,337
76 282,338
77 282,339
372 282,341
387 282,340
398 282,342
D8— 16 282,344
40 282,343
49 282,345
66 282,346
D9— 341 282,348
395 282,349
403 282,347
D10— 47 282,350
76 282,351
81 282,352
D11— 82 282,353
96 282,354
132 282,355
D14— 4 282,356
11 282,357
52 282,358
53 282,359
59 282,360
60 282,361
63 282,362
282,363
64 282,364
94 282,365
102 282,366
D15— 10 282,367
21 282,368
139 282,369
147 282,370
282,371
D16— 102 282,372
D18— 1 282,373
282,374
6 282,375
7 282,376
D19— 26 282,377
43 282,378
52 282,379
75 282,380
D21— 20 282,381
34 282,382
63 282,383
78 282,384
115 282,385
192 282,386
230 282,387
D22— 7 282,388
13 282,389
18 282,390
29 282,391
D23— 17 282,392
20 282,393
37 282,394
121 282,395
162 282,396
D24— 2 282,397
7 282,398
17 282,399
26 282,400
282,401
29 282,402
54 282,403

CLASSIFICATION OF PLANTS

P.— 8 5,645
12 5,646
15 5,647
23 5,648
33 5,649
38 5,650
39 5,651
89 5,652

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,566,586
4,566,609
4,567,348
4,567,569
02 : 4,566,219
04 : 4,566,237
4,566,290
4,566,434
4,566,839
4,566,855
4,567,172
4,567,384
4,567,388
4,567,441
4,567,463
4,567,549
4,567,571
4,567,593
4,567,603
05 : 4,566,664
4,566,734
06 : Re.32,075
4,566,144
4,566,183
4,566,184
4,566,222
4,566,236
4,566,238
4,566,255
4,566,296
4,566,297
4,566,313
4,566,342
4,566,356
4,566,376
4,566,432
4,566,448
4,566,449
4,566,452
4,566,476
4,566,485
4,566,488
4,566,496
4,566,501
4,566,502
4,566,507
4,566,551
4,566,590
4,566,616
4,566,619
4,566,655
4,566,656
4,566,657
4,566,672
4,566,691
4,566,693
4,566,702
4,566,712
4,566,713
4,566,714
4,566,732
4,566,768
4,566,788
4,566,800
4,566,814
4,566,818
4,566,829
4,566,840
4,566,846
4,566,914
4,566,932
4,566,933
4,566,988
4,567,017
4,567,045
4,567,050
4,567,054
4,567,058
4,567,100
4,567,104
4,567,119
4,567,138
4,567,144
4,567,149
4,567,154
4,567,173
4,567,244
4,567,264
4,567,273
4,567,274
4,567,283
4,567,301
4,567,311
4,567,312
4,567,314
4,567,319
4,567,359
4,567,363
4,567,368
4,567,375
4,567,379
4,567,391
4,567,420
4,567,426
4,567,452
4,567,461
4,567,464
4,567,491
4,567,505
4,567,531
4,567,562
4,567,563
4,567,565
4,567,574
4,567,580
4,567,594
4,567,597
4,567,606
4,567,609
3,750,257
08 : 4,566,205
4,566,212
4,566,652
4,566,857
4,566,937
4,567,215
4,567,462
09 : 4,566,170
4,566,191
4,566,202
4,566,280
4,566,321
4,566,394
4,566,612
4,566,618
4,566,620
4,566,659
4,566,685
4,566,700
4,566,749
4,566,856
4,566,876
4,566,878
4,566,894
4,566,939
4,566,957
4,566,978
4,567,031
4,567,033
4,567,040
4,567,048
4,567,066
4,567,117
4,567,142
4,567,179
4,567,236
4,567,257
4,567,287
4,567,320
4,567,328
4,567,473
4,567,545
4,567,570
10 : 4,566,898
4,567,003
4,567,289
12 : 4,566,178
4,566,192
4,566,198
4,566,213
4,566,243
4,566,287
4,566,358
4,566,382
4,566,393
4,566,397
4,566,433
4,566,454
4,566,467
4,566,696
4,566,708
4,566,796
4,566,838
4,567,185
4,567,317
4,567,324
4,567,385
4,567,456
4,567,512
4,567,513
4,567,521
4,567,539
4,567,543
4,567,561
13 : 4,566,136
4,566,208
4,566,248
4,566,253
4,566,292
4,566,365
4,566,524
4,566,626
4,566,688
4,566,867
4,566,926
4,567,517
4,567,588
4,567,591
15 : 4,566,438
16 : 4,567,474
17 : 4,566,142
4,566,162
4,566,167
4,566,195
4,566,211
4,566,229
4,566,257
4,566,325
4,566,351
4,566,386
4,566,423
4,566,424
4,566,481
4,566,509
4,566,603
4,566,720
4,566,745
4,566,746
4,566,789
4,566,802
4,566,817
4,566,822
4,566,827
4,566,923
4,567,022
4,567,023
4,567,055
4,567,155
4,567,213
4,567,243
4,567,265
4,567,270
4,567,309
4,567,318
4,567,323
4,567,410
4,567,422
4,567,447
4,567,540
4,567,546
4,567,595
4,567,604
18 : 4,566,138
4,566,146
4,566,147
4,566,166
4,566,180
4,566,285
4,566,331
4,566,439
4,566,477
4,566,508
4,566,517
4,566,552
4,566,564
4,566,572
4,566,666
4,566,678
4,566,689
4,566,743
4,566,953
4,566,990
4,567,067
4,567,193
4,567,266
4,567,302
4,567,304
19 : 4,566,327
4,566,473
4,566,695
4,566,854
4,566,910
4,567,486
20 : 4,566,512
21 : 4,566,445
4,566,468
4,567,246
4,567,421
22 : 4,566,408
4,566,966
4,567,152
4,567,156
4,567,205
4,567,229
4,567,567
23 : 4,566,216
24 : Re.32,074
4,566,230
4,566,596
4,566,629
4,566,760
4,566,791
4,566,889
4,566,943
4,567,013
4,567,016
4,567,065
4,567,087
4,567,095
4,567,296
4,567,572
4,567,607
25 : 4,566,172
4,566,179
4,566,269
4,566 352
4,566,353
4,566,458

4,566,532
4,566,594
4,566,624
4,566,627
4,566,636
4,566,698
4,566,721
4,566,761
4,566,771
4,566,772
4,566,808
4,566,851
4,566,861
4,567,041
4,567,105
4,567,249
4,567,281
4,567,357
4,567,361
4,567,395
4,567,502
4,567,578
4,567,610
26 : 4,566,137
4,566,160
4,566,203
4,566,206
4,566,251
4,566,278
4,566,295
4,566,304
4,566,338
4,566,349
4,566,403
4,566,444
4,566,490
4,566,565
4,566,578
4,566,581
4,566,592
4,566,608
4,566,617
4,566,649
4,566,715
4,566,728
4,566,733
4,566,747
4,566,842
4,567,000
4,567,001
4,567,005
4,567,099
4,567,120
4,567,141
4,567,212
4,567,231
4,567,377
4,567,608
27 : Re.32,073
4,566,207
4,566,286
4,566,320
4,566,440
4,566,446
4,566,684
4,566,794
4,566,816
4,566,831
4,566,981
4,567,073
4,567,094
4,567,096
4,567,133

28 : 4,566,151
4,566,214
4,567,137
29 : 4,566,197
4,566,542
4,566,639
4,566,663
4,567,158
4,567,284
4,567,299
4,567,332
4,231,105
30 : 4,566,545
4,566,948
4,567,515
31 : 4,566,872
4,567,026
32 : 4,566,826
33 : 4,566,345
4,566,770
4,566,781
4,567,110
4,567,370
4,567,487
4,567,532
34 : 4,566,149
4,566,154
4,566,171
4,566,181
4,566,217
4,566,224
4,566,281
4,566,291
4,566,387
4,566,395
4,566,461
4,566,503
4,566,506
4,566,525
4,566,526
4,566,555
4,566,556
4,566,726
4,566,790
4,566,862
4,566,879
4,566,893
4,566,896
4,566,934
4,566,965
4,566,969
4,566,980
4,566,991
4,567,035
4,567,037
4,567,038
4,567,062
4,567,079
4,567,091
4,567,101
4,567,107
4,567,129
4,567,130
4,567,145
4,567,157
4,567,166
4,567,167
4,567,171

4,567,148
4,567,237
4,567,269
4,567,428
4,567,438

4,567,216
4,567,227
4,567,247
4,567,258
4,567,298
4,567,310
4,567,325
4,567,381
4,567,387
4,567,431
4,567,500
4,567,516
4,567,524
4,567,557
4,567,560
36 : 4,566,158
4,566,185
4,566,200
4,566,241
4,566,294
4,566,326
4,566,372
4,566,464
4,566,575
4,566,584
4,566,597
4,566,601
4,566,607
4,566,660
4,566,661
4,566,683
4,566,697
4,566,752
4,566,782
4,566,798
4,566,801
4,566,869
4,566,913
4,566,917
4,566,993
4,567,019
4,567,029
4,567,036
4,567,039
4,567,044
4,567,075
4,567,118
4,567,143
4,567,151
4,567,183
4,567,186
4,567,204
4,567,214
4,567,218
4,567,256
4,567,279
4,567,344
4,567,349
4,567,378
4,567,390
4,567,425
4,567,436
4,567,471
4,567,490
4,567,503
4,567,514
4,567,544
4,567,547
4,567,551
37 : 4,566,220
4,566,312
4,566,480
4,566,498

4,566,504
4,566,573
4,566,646
4,566,804
4,566,986
4,567,074
4,567,590
38 : 4,566,247
39 : 4,566,221
4,566,239
4,566,261
4,566,293
4,566,340
4,566,466
4,566,493
4,566,510
4,566,530
4,566,568
4,566,600
4,566,621
4,566,719
4,566,735
4,566,757
4,566,906
4,566,929
4,566,962
4,566,973
4,566,974
4,566,983
4,566,984
4,567,047
4,567,069
4,567,072
4,567,102
4,567,103
4,567,209
4,567,211
4,567,331
4,567,335
4,567,337
4,567,396
4,567,404
4,567,412
4,567,429
4,567,467
4,567,482
4,251,648
40 : 4,566,168
4,566,242
4,566,301
4,566,484
4,566,486
4,566,579
4,566,967
4,566,979
4,567,159
4,567,340
4,567,469
4,567,582
41 : 4,566,186
4,566,190
4,566,193
4,566,209
4,566,441
4,566,758
4,567,081
4,567,405
42 : 4,566,164
4,566,266
4,566,284
4,566,305
4,566,400
4,566,406

4,566,450
4,566,483
4,566,511
4,566,630
4,566,637
4,566,658
4,566,687
4,566,690
4,566,724
4,566,848
4,566,888
4,566,890
4,566,891
4,566,949
4,566,989
4,567,025
4,567,032
4,567,128
4,567,184
4,567,191
4,567,228
4,567,239
4,567,267
4,567,268
4,567,276
4,567,290
4,567,307
4,567,333
4,567,400
4,567,440
4,567,466
4,567,581
44 : 4,567,437
45 : 4,566,188
4,566,727
4,566,835
4,566,884
47 : 4,566,339
4,566,388
4,566,558
4,566,561
4,566,707
4,566,950
4,567,012
4,567,350
4,567,372
4,567,523
48 : Re.32,072
4,566,175
4,566,223
4,566,246
4,566,307
4,566,311
4,566,314
4,566,317
4,566,318
4,566,335
4,566,429
4,566,455
4,566,462
4,566,478
4,566,482
4,566,494
4,566,495
4,566,534
4,566,535
4,566,536
4,566,537
4,566,538
4,566,539
4,566,540
4,566,544
4,566,546

4,566,665
4,566,671
4,566,692
4,566,701
4,566,729
4,566,935
4,566,936
4,566,956
4,566,964
4,566,976
4,567,007
4,567,011
4,567,042
4,567,043
4,567,051
4,567,153
4,567,223
4,567,241
4,567,251
4,567,330
4,567,343
4,567,373
4,567,389
4,567,430
4,567,432
4,567,439
4,567,577
4,567,579
4,567,583
4,567,587
4,270,606
49 : 4,566,150
4,566,505
4,566,640
4,566,703
4,566,919
50 : 4,566,580
51 : 4,566,447
4,566,469
4,566,645
4,567,132
4,567,240
4,567,401
4,567,407
4,567,479
53 : 4,566,231
4,566,288
4,566,371
4,566,632
4,566,668
4,566,699
4,567,458
4,567,480
4,567,483
4,567,494
54 : 4,566,977
4,567,226
55 : 4,566,256
4,566,366
4,566,489
4,566,520
4,566,560
4,566,574
4,566,674
4,566,717
4,566,938
4,566,945
4,566,985
4,567,076
4,567,111
4,567,341
56 : 4,566,527

DESIGN PATENTS

06 : 282,311
282,313
282,320
282,334
282,352
282,390
08 : 282,403
09 : 282,335
282,375
282,400

13 : 282,321
282,342
17 : 282,323
282,347
282,394
18 : 282,358
21 : 282,315
24 : 282,308
26 : 282,344

282,401

282,382
282,391
27 : 282,336
282,366
29 : 282,389
34 : 282,322
282,333
36 : 282,325
282,328
282,332

282,377
282,381
282,385
282,393
37 : 282,312
282,363
282,397
38 : 282,341
39 : 282,326
282,338

282,349
282,355
282,392
282,399
41 : 282,369
282,380
42 : 282,402
44 : 282,337
282,356
282,359

46 : 282,396
48 : 282,314
282,368
282,388
51 : 282,354
53 : 282,330
55 : 282,324
282,351
282,398

PLANT PATENTS

06 : 5,645

5,647

5,649

5,650

16 : 5,651

34 : 5,652

U.S. GOVERNMENT PRINTING OFFICE : O—1986

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ **Domestic; @ $** **Foreign.**

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*